Service Manual

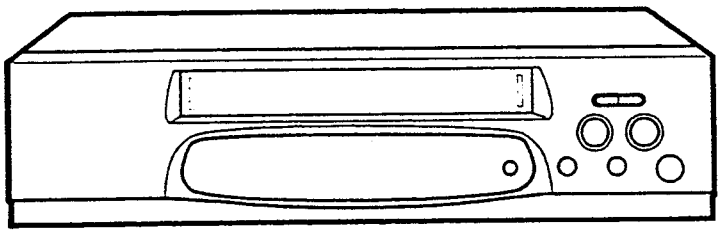
ORION

VH-2799 HiFi

VN-396 VR 2972

VN-418 VR 2973

VIDEO CASSETTE RECORDER



VHS
PAL

Änderungen vorbehalten!

Chassis Code:

A

Bestell-Nr.:

7931

SPECIFICATIONS

Power Source :	AC230V/50Hz
Power Consumption :	Approx. 22W
Power Consumption-stand-by :	Less than 6W
Operation Temperature :	5℃ to 40℃
Television System :	CCIR : 625 lines, 50 fields PAL NTSC Playback in PAL 60Hz
Video Recording System :	VHS, 2 rotary heads, helical scanning system Luminance:FM azimuth recording Colour Signal:Converted subcarrier phase shift recording
Tape Format :	12.65mm high density tape
RF Output Channel :	67 (53~69, Adjustable) channel
F.FWD/REW Time :	2'30" (with E-180 cassette)
Audio Track :	3 track (Hi-Fi Sound 2track, Normal 1 track)
Hi-Fi Audio Recording System :	Depth Multiplex Recording Rotary, Slant Azimuth Two Head Helical Scan System
Tape Speed :	SP:23.39mm/s, NTSC:SP:33.35mm/s LP:11.69mm/s
Hi-Fi Audio Signal :	Output Level Line:-3.8dB 1K ohm S/N Ratio:More Than 65 dB Dynamic Range:More Than 75dB Frequency Response:20Hz - 20KHz (± 6db) Wow And Flutter:Less Than 0.01% Wrms
Heads :	Video:4 rotary heads FM Audio:2 rotary heads Audio/Control:1 stationary head Erase:1 full track erase
Input Level :	Video:1.0Vp-p, 75 ohm unbalanced Audio:RCA:300 mV, 50K ohm unbalanced SCART:500 mV, 50K ohm unbalanced
Output Level :	Video:1.0Vp-p, 75 ohm unbalanced Audio:RCA:390 mV, 1K ohm unbalanced SCART:500 mV, 1K ohm unbalanced Hi-Fi Audio:500 mV, 1K ohm unbalanced
Weight :	3.7 Kg
Dimension :	355 (W) × 92 (H) × 273 (D) mm

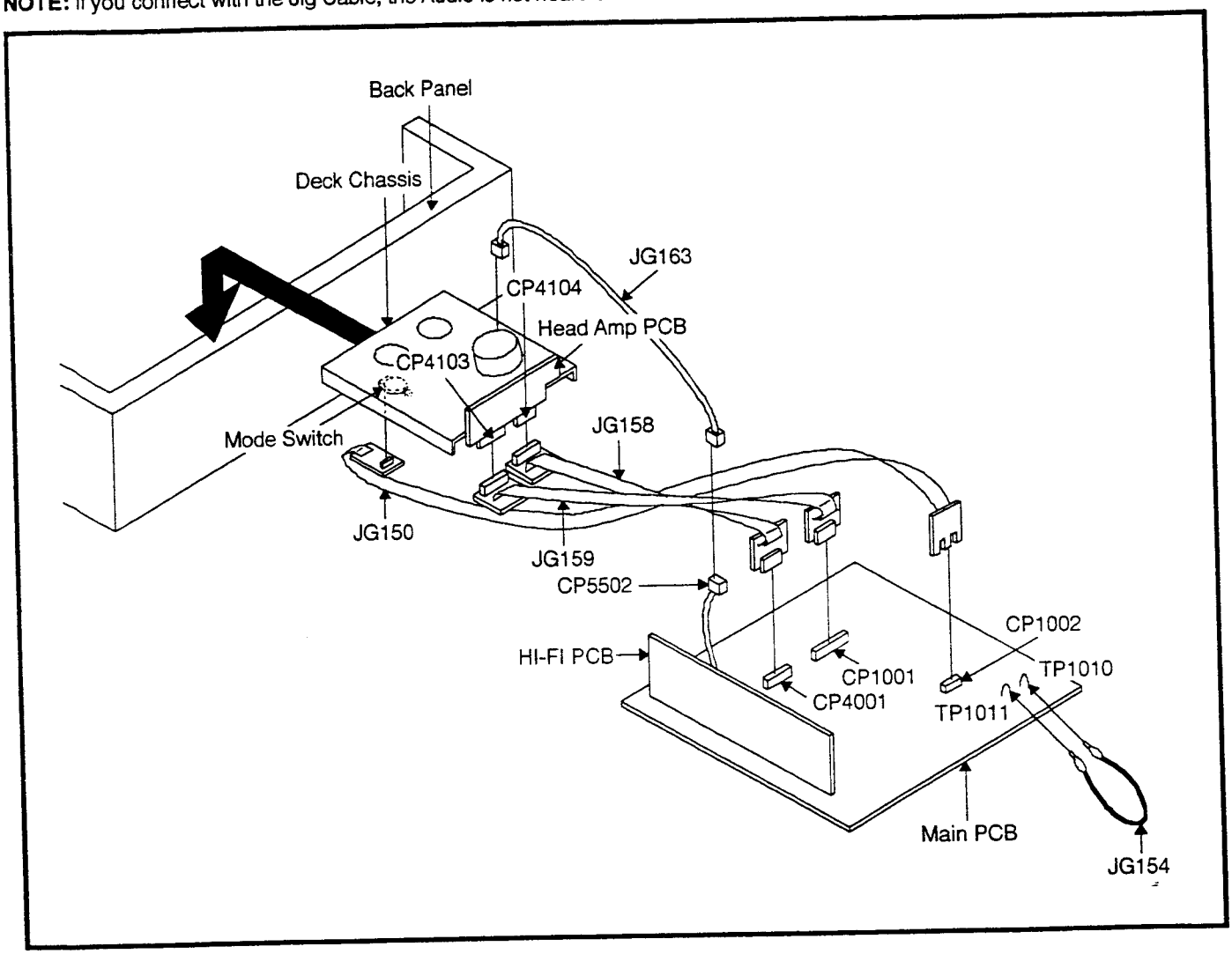
Design and specifications are subject to change without notice.

PREPARATION FOR SERVICING

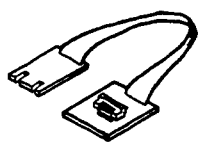
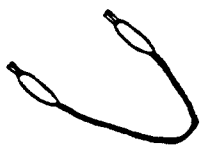
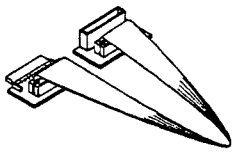
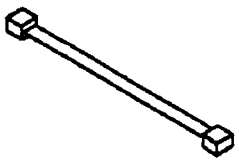
How to use the Servicing Fixture

1. Remove the Main PCB from the Deck Chassis.
2. Connect as shown in the below figure using the Service Fixture.
   - ○ Connect the Main PCB to the Mode Switch with the cable JG150.
   - ○ Connect the Main PCB to the Head Amp PCB with the cable JG158 and JG159.
   - ○ Connect the Main PCB to the FE Head with the cable JG163.
3. Short circuit between **TP1010** and **TP1011** with the cable JG154.
   (Refer to MAJOR COMPONENT LOCATION GUIDE)
4. The EOT, BOT and Reel Sensor do not work at this moment.
5. At that time, the STOP/EJECT button is available to insert and eject the Cassette Tape.

NOTE: If you connect with the Jig Cable, the Audio is not heard on Hi-Fi.



SERVICING FIXTURES AND TOOLS

JG150 Cable	JG154 Cable	JG158 Cable (16 Pins) JG159 Cable (20 Pins)	JG163 Cable
			

Part No.	Remarks
JG150	Used to connect the MAIN PCB and MODE SWITCH
JG154	Used to connect the test point of SERVICE and GROUND
JG158/JG159	Used to connect the MAIN PCB and HEAD AMP PCB
JG163	Used to connect the HI-FI PCB and FE HEAD

SERVICING NOTICES ON CHECKING

1. KEEP THE NOTICES

As for the places which need special attentions, they are indicated with the labels or seals on the cabinet, chassis and parts. Make sure to keep the indications and notices in the operation manual.

2. USE THE DESIGNATED PARTS

The parts in this equipment have the specific characters of incombustibility and withstand voltage for safety. Therefore, the part which is replaced should be used the part which has the same character.
Especially as to the important parts for safety which is indicated in the circuit diagram or the table of parts as a ⚠ mark, the designated parts must be used.

3. PUT PARTS AND WIRES IN THE ORIGINAL POSITION AFTER ASSEMBLING OR WIRING

There are parts which use the insulation material such as a tube or tape for safety, or which are assembled in the condition that these do not contact with the printed board. The inside wiring is designed not to get closer to the pyrogenic parts and high voltage parts. Therefore, put these parts in the original positions.

4. PERFORM A SAFETY CHECK AFTER SERVICING

Confirm that the screws, parts and wiring which were removed in order to service are put in the original positions, or whether there are the portions which are deteriorated around the serviced places serviced or not. Check the insulation between the antenna terminal or external metal and the AC cord plug blades. And be sure the safety of that.

HOW TO ORDER PARTS

Please include the following informations when you order parts. (Particularly the CHASSIS CODE.)
1. MODEL NUMBER and CHASSIS CODE
   You can find it in the back of your unit.
2. PART NO. and DESCRIPTION
   You can find it in your SERVICE MANUAL.

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DISASSEMBLY INSTRUCTIONS

1. REMOVAL OF MECHANICAL PARTS AND P.C. BOARDS

1-1: TOP CABINET AND FRONT CABINET (Refer to Fig. 1-1)

1. Remove the 4 screws ①.
2. Remove the Top Cabinet and Angle Deck Back in the direction of arrow (A).
3. Disconnect the following connector: (CP651 3 pins).
4. Unlock the 2 supports ②.
5. Remove the Front Cabinet in the direction of arrow (B).
6. Remove the 3 screws ③ and remove the Operation PCB.

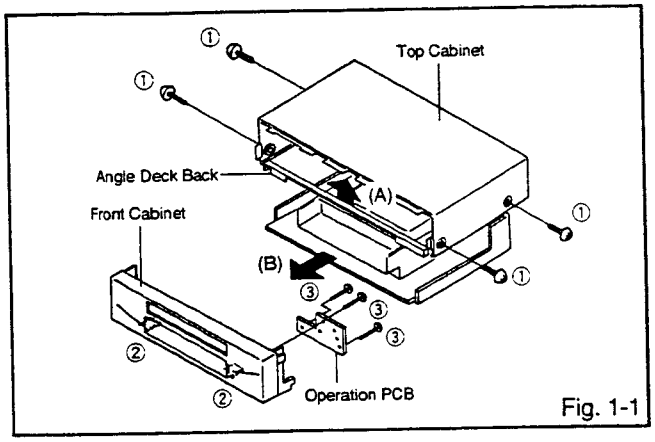


Fig. 1-1

1-2: LOCATION OF P.C. BOARDS (Refer to Fig. 1-2)

CAUTION: BEFORE ATTEMPTING TO REMOVE OR REPAIR ANY PCB, UNPLUG THE POWER CORD FROM THE AC SOURCE.

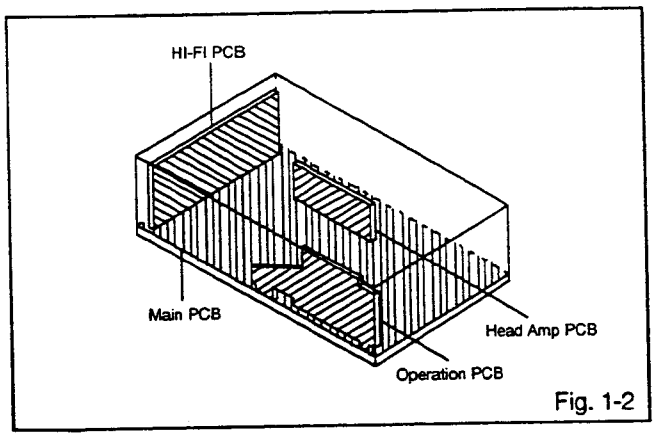


Fig. 1-2

1-3: BOTTOM CHASSIS (Refer to Fig. 1-3)

1. Remove the 2 screws ①.
2. Unlock the 2 supports ②.
3. Remove the Bottom Chassis in the direction of arrow.

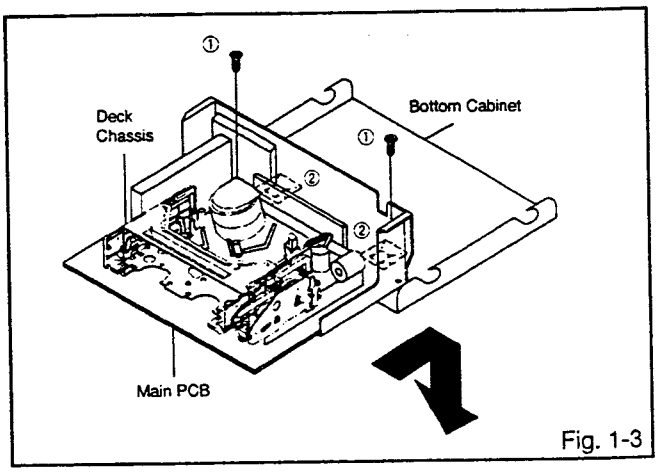


Fig. 1-3

1-4: FLAP (Refer to Fig. 1-4)

1. Open Flap to 90° and flex in direction of arrow (A), at the same time slide in direction of arrow (B).
2. Then lift in direction of arrow (C).

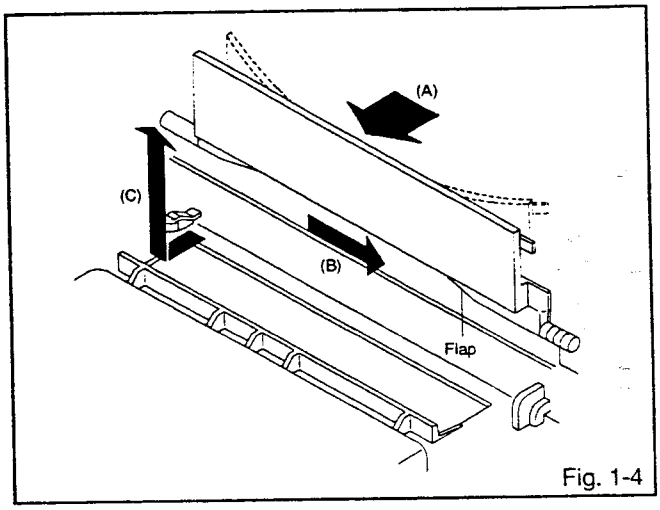


Fig. 1-4

1-5: DECK CHASSIS (Refer to Fig. 1-5)

1. Remove the 3 screws ①.
2. Remove the screw ②.
3. Disconnect the 4 connectors: (CP1001 20 pins, CP4001 16 pins, CP4107 4 pins and CP5502 2 pins) and remove the Deck Chassis in the direction of arrow.

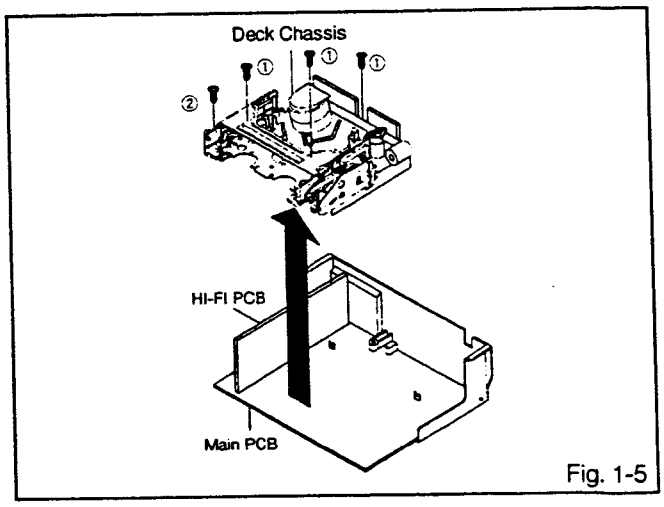


Fig. 1-5

DISASSEMBLY INSTRUCTIONS

1-6: MAIN PCB AND BACK PANEL (Refer to Fig. 1-6)

1. Remove the 2 screws ①.
2. Remove the 2 screws ②.
3. Remove the Main PCB in the direction of arrow.

NOTE

AC Cord must be removed from the fitting in the back panel before the Main PCB can be removed.

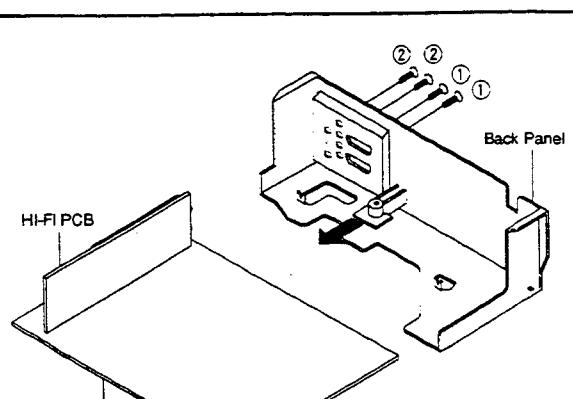


Fig. 1-6

1-7: CHASSIS SECTION AND UNIT ASS'Y (Refer to Fig. 1-7)

1. Remove the screw ①.
2. Remove the screw ②.
3. Remove Unit Ass'y in the direction of arrow (A).

NOTE

When installing the Unit Ass'y, align the timing marks and pull the Cassette Holder Ass'y in the direction of arrow (B).

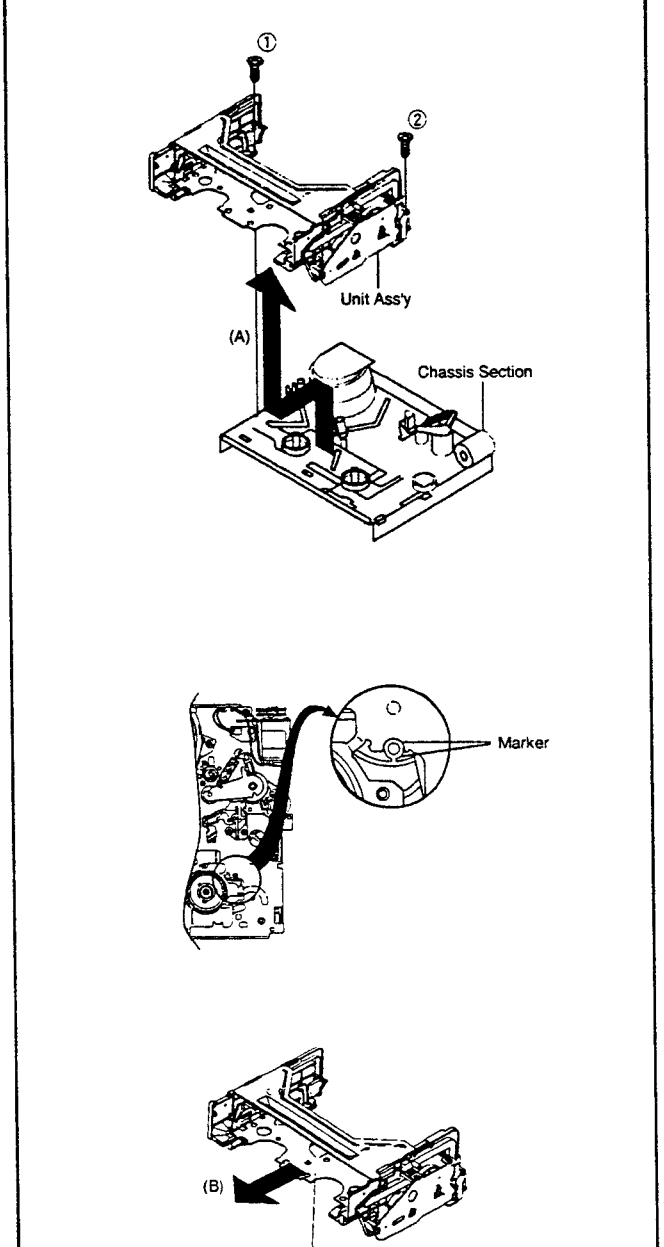


Fig. 1-7

DISASSEMBLY INSTRUCTIONS

2. REMOVAL OF DECK PARTS

2-1: LINK GEAR (R) / CLUTCH GEAR (Refer to Fig. 2-1)

1. Unlock the support ①.
2. Remove the BOT Sensor Cover and BOT Reflector.
3. Unlock the 3 supports ②.
4. Remove the Side Bracket R2 and Spring Earth.
5. Remove the Flap Lever, Link Gear (R) , Cam Gear Ass'y and BOT Lever.

NOTE

When installing the Link Ass'y and Link Gear (R), align the timing Marks.

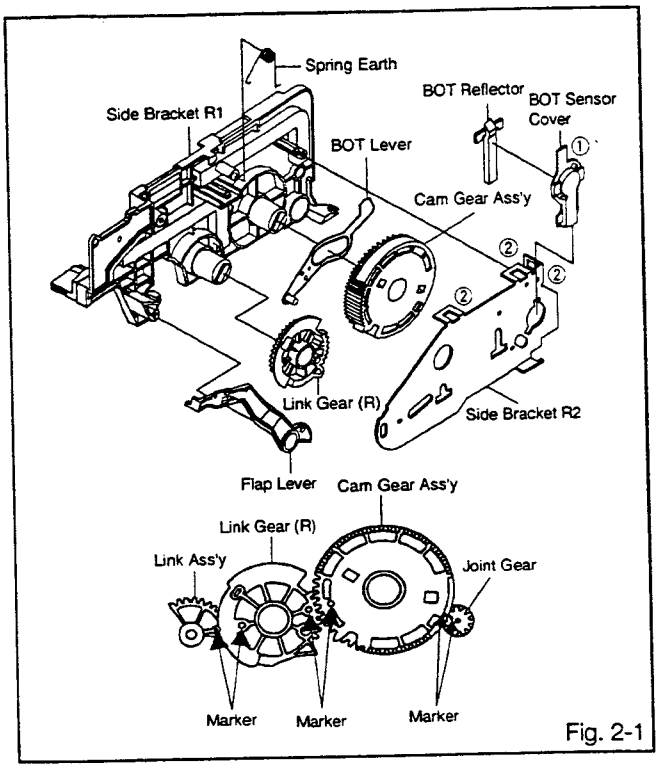


Fig. 2-1

2-2: TOP BRACKET / TAPE PIECE GUIDE (Refer to Fig. 2-2)

1. Unlock the 4 supports ①.
2. Remove the Top Bracket.
3. Remove the Side Bracket R1 and Side Bracket L.
4. Unlock the support ②.
5. Remove the Joint Gear.
6. Remove the Bracket R Spring.

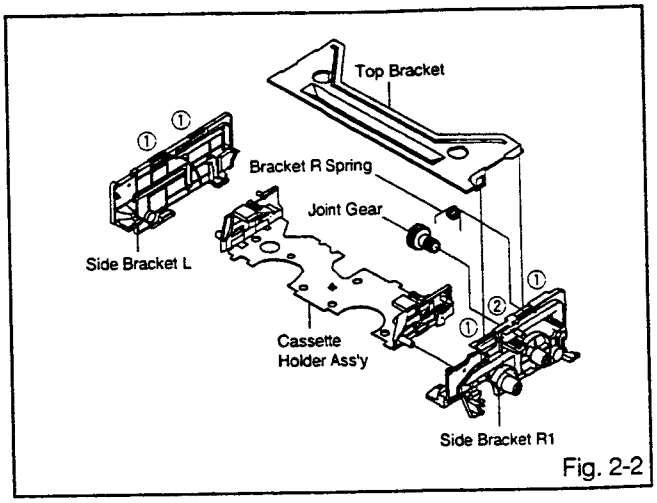


Fig. 2-2

2-3: LINK ASS'Y (Refer to Fig. 2-3)

1. After removing in the direction (A) of Link Ass'y, remove the Link Ass'y in the direction (B).

NOTE

Install the (B) first, then install the (A).

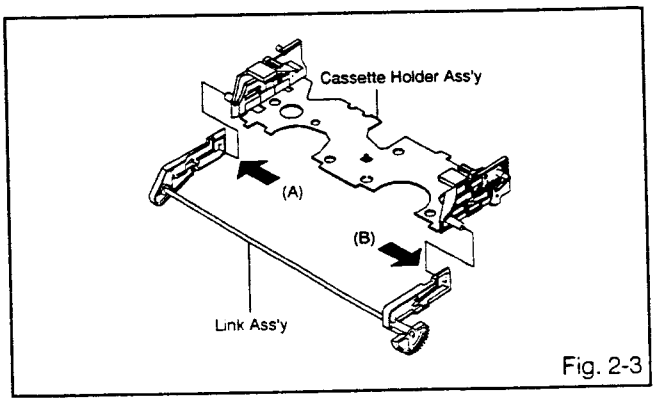


Fig. 2-3

2-4: CASSETTE SIDE R (Refer to Fig. 2-4)

1. Unlock the 2 supports ①.
2. Remove the Cassette Side R.
3. Remove the Pack Spring.
4. Remove the Locker Spring.
5. Unlock support ②.
6. Remove the Locker R.

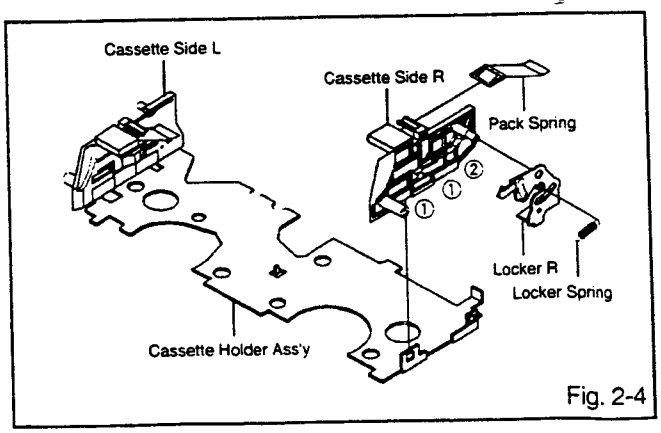


Fig. 2-4

DISASSEMBLY INSTRUCTIONS

2-5: CASSETTE SIDE L (Refer to Fig. 2-5)

1. Unlock the 2 supports ①.
2. Remove the Cassette Side L.
3. Remove the Pack Spring.
4. Remove the Locker Spring.
5. Unlock the support ②.
6. Remove the Locker L.

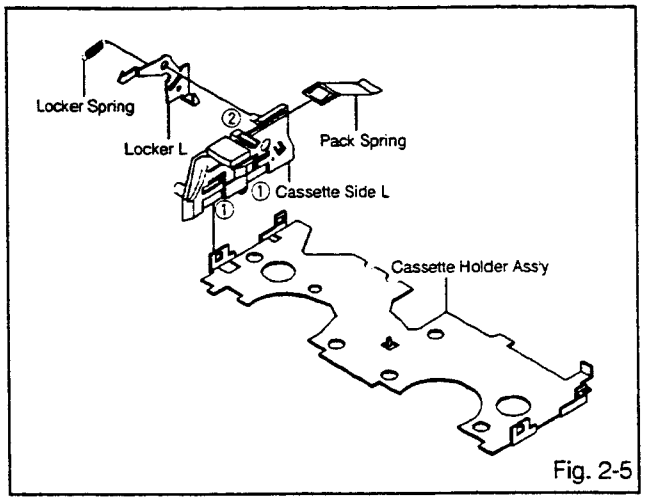


Fig. 2-5

2-6: BRAKE BRACKET (Refer to Fig. 2-6)

1. Remove the Main Brake Spring, S-S Brake Spring, Joint Arm Spring and T-S Brake Spring.
2. Remove the 2 screws ①.
3. Remove the screw ②.
4. Remove the Brake Bracket.
5. Remove the Sub Brake S, Sub Brake T, Main Brake S Ass'y and Main Brake T Ass'y.
6. Remove the Joint Arm.
7. Remove the Reflector LED 2.

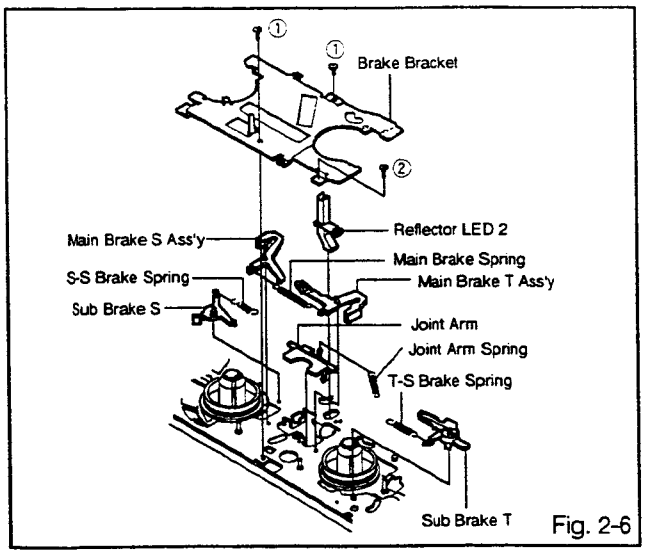


Fig. 2-6

2-7: TENSION BAND (Refer to Fig. 2-7)

1. Remove the Tension Arm Spring 1.
2. Remove the Tension Arm Spring 2.
3. Remove the Tension Adjust.
4. Remove the Tension Arm Ass'y.
5. Remove the Tension Band Ass'y.
6. Remove the Tension Lever 2 Ass'y.

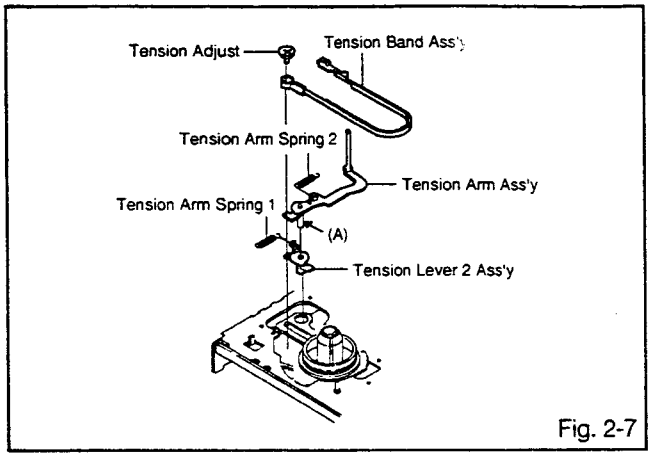


Fig. 2-7

NOTE

1. Install the Tension Band Ass'y without twisting it.
2. Turbine Oil (Lubricating Grade #150) the area marked with A in **Fig. 2-7.**

EX: KYOUDO Oil Sulaidasu #150
IDEMITSU Oil SuSper Multi #150

2-8: REEL DISK (Refer to Fig. 2-8)

1. Remove the Reel Disk S and Reel Disk T.
2. Remove the 2 polyslider washers.

NOTES

1. Installation of Reel Disk after performing step 1, 2 and 3 in section 2-7 of DISASSEMBLY INSTRUCTIONS.
2. The Height Adjustment washers are sometimes attached to the back of the Reel Disk.
3. Clean the Reel Disk Shaft and put in height adjusting washers.
4. Be careful not to damage the Tension Band Ass'y at the time of removal and installation.
5. Be careful not to scratch the Reel Disk Shaft with the polyslider washer or the tool at the time of removal and installation.
6. After oiling (Lubricating Grade #150) the Reel Disk Shaft, install the new Reel Disk S and Reel Disk T again.

EX: KYOUDO Oil Sulaidasu #150
IDEMITSU Oil Super Multi #150

7. After installation, adjust the height of the Reel Disk. **(Refer to item 1-1 of MECHANICAL ADJUSTMENTS)**
8. After installation, adjust and confirm the tension post position. **(Refer to item 1-2 of MECHANICAL ADJUSTMENTS)**

DISASSEMBLY INSTRUCTIONS

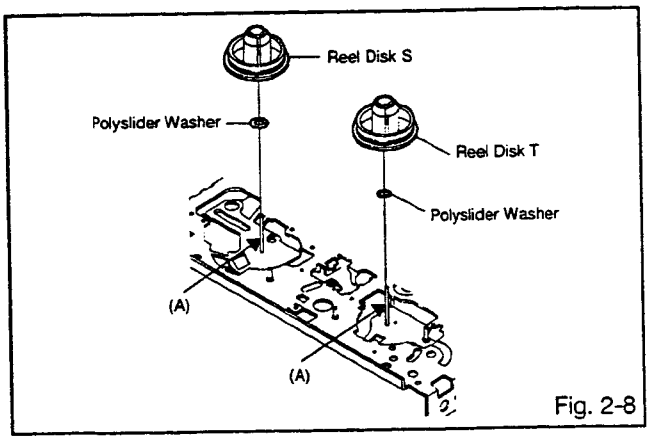


Fig. 2-8

2-9: PINCH ROLLER / CASSETTE OPENER (Refer to Fig. 2-9)

1. Unlock the support ①.
2. Remove the Pinch Roller.
3. Remove the screw ②.
4. Unlock the 2 supports ③.
5. Remove the Cassette Opener.
6. Remove the Spring P5 and Arm P5 Ass'y.
7. Remove the Cam Gear and Cam Pinch Roller.
8. Remove the polyslider washer and Cam P5.

NOTES

1. Do not touch the Pinch Roller. (Use gloves.)
2. When installing the Cam P5, Cam Pinch Roller and Cam Gear, align the timing marks.

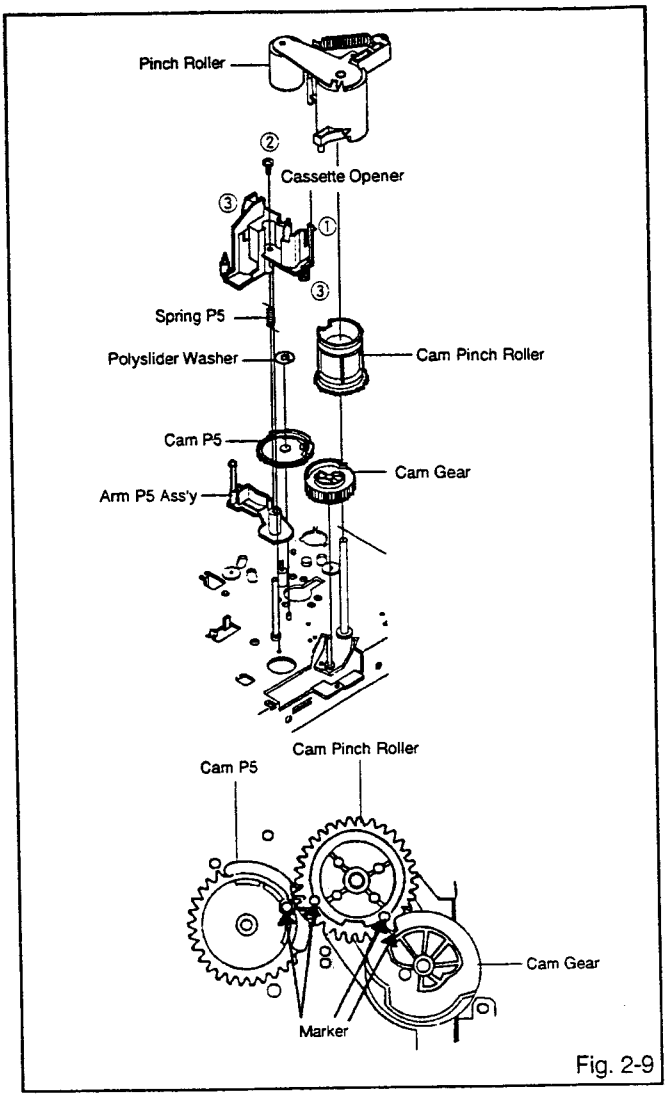


Fig. 2-9

2-10: AUDIO CONTROL HEAD (Refer to Fig. 2-10)

1. Disconnect the connector: (CP4106 6 pins) on the Head Amp PCB.
2. Remove the 3 screws ①.
3. Remove the 3 Audio Control Head Springs.
4. Remove the Audio Control Head.

NOTES

1. Do not touch the head by any means when replacing the Audio Control Head. (Use gloves.)
2. After replacement, confirm the following adjustments.
   a. MECHANICAL ADJUSTMENTS: ITEM 2-2
   b. MECHANICAL ADJUSTMENTS: ITEM 2-3

DISASSEMBLY INSTRUCTIONS

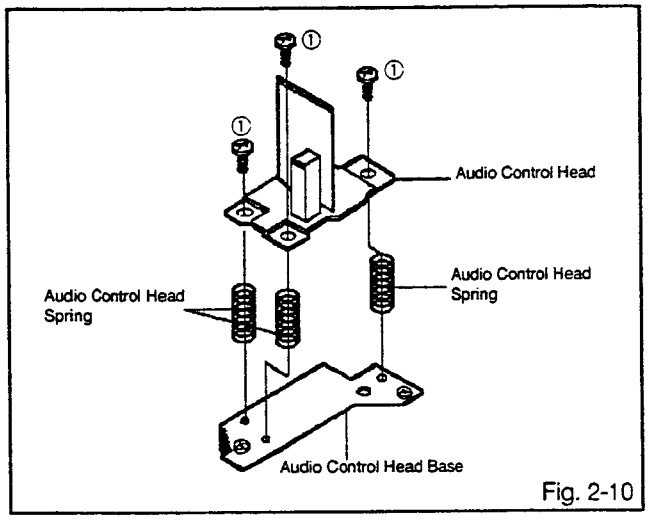


Fig. 2-10

2-11: CYLINDER UNIT (Refer to Fig. 2-11)

1. Disconnect the following connectors:
   (CP4101 6 pins and CP4102 5 pins).
2. Remove the Joint Screw, then remove the Azimuth Spring.
3. Remove the 2 screws ①, then remove the Polyslider Washer and Cylinder Unit from the Main Chassis.

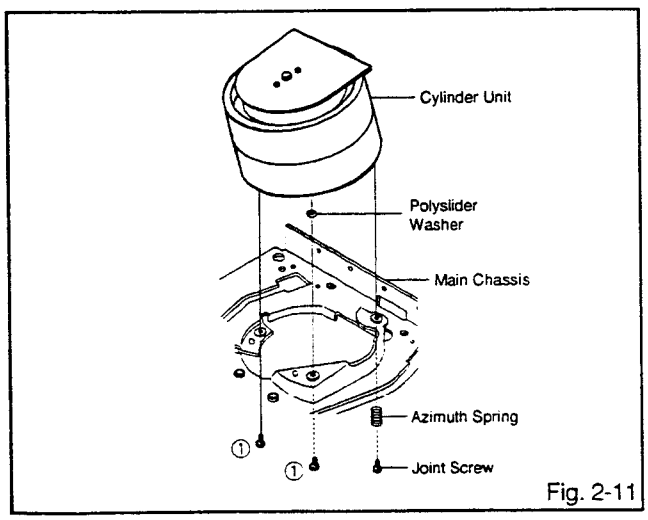


Fig. 2-11

2-12: PLATE BOTTOM (Refer to Fig. 2-12)

1. Remove the Capstan Belt.
2. Remove the 2 screws ①.
3. Remove the 3 screws ②.
4. Remove the Mode Switch.
5. Remove the Tension Lever Spring.
6. Remove the Plate Bottom.

NOTE

When installing the Mode Switch, align the timing position.

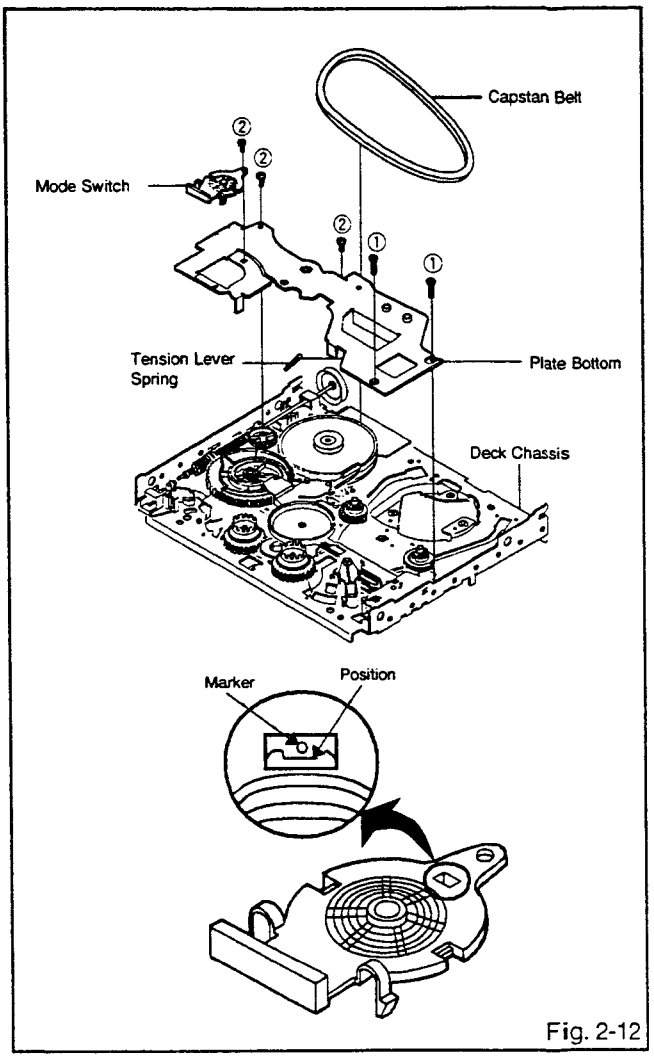


Fig. 2-12

2-13: CENTER PULLEY (Refer to Fig. 2-13)

1. Remove the polyslider washer ①.
2. Remove the Center Pulley.
3. Remove the polyslider washer ②.
4. Remove the Center Pulley Spring.
5. Remove the Idler Arm Ass'y.
6. Remove the 2 polyslider washers ③.
7. Remove the Clutch Gear T Ass'y and Clutch Gear S Ass'y.

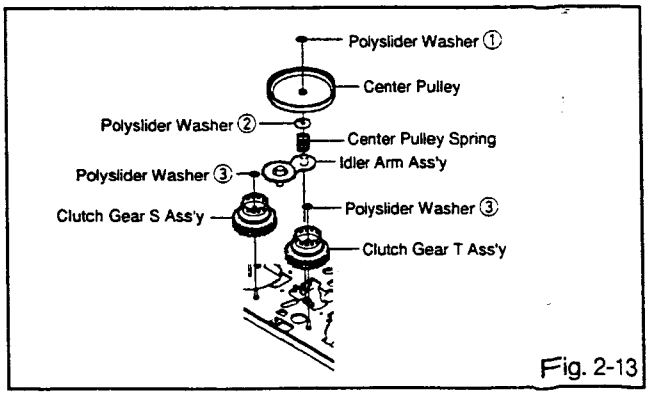


Fig. 2-13

DISASSEMBLY INSTRUCTIONS

2-14: MAIN CAM (Refer to Fig. 2-14)

1. Remove the Loading Lever.
2. Remove the Main Brake Lever.
3. Remove the Capstan Brake Spring.
4. Remove the Capstan Brake Ass'y.
5. Remove the Main Rod Spring.
6. Remove the Tension Holder.
7. Remove the Tension Lever.
8. Remove the Main Cam.
9. Remove the Middle Gear.
10. Remove the Main Rod Ass'y.

NOTES

1. When installing the Main Rod Ass'y, install side (B) first, then install side (A).
2. When installing the Loading Lever, align the timing marks.

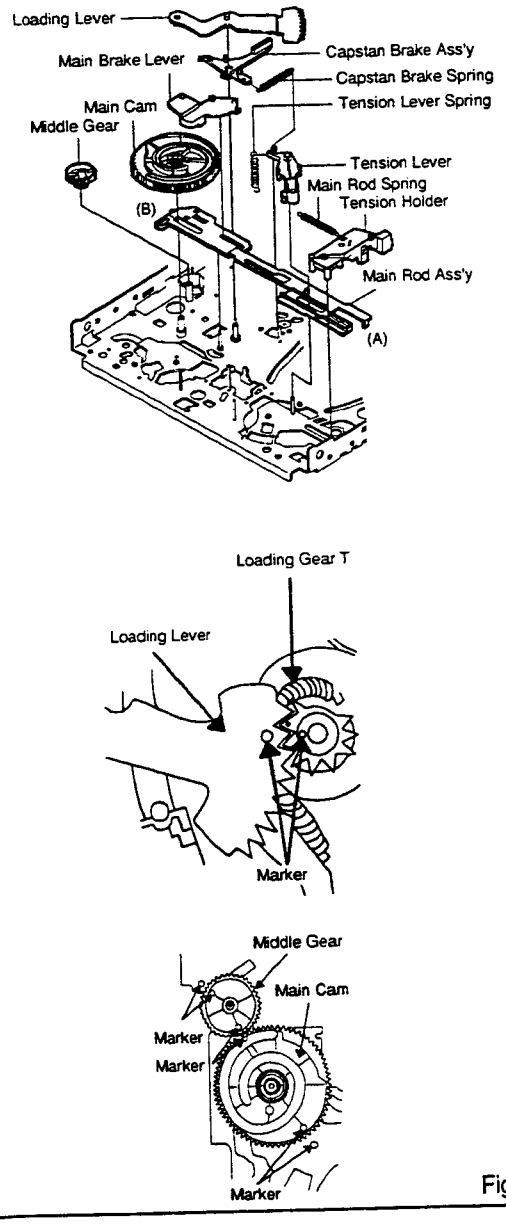


Fig. 2-14

2-15: CAPSTAN DD UNIT (Refer to Fig. 2-15)

1. Remove the screw ①.
2. Disconnect the CP4105 9 pins.
3. Remove the 3 screws ②.
4. Remove the Capstan DD Unit.

NOTE

Use the specified screw to hold the Capstan DD Unit.

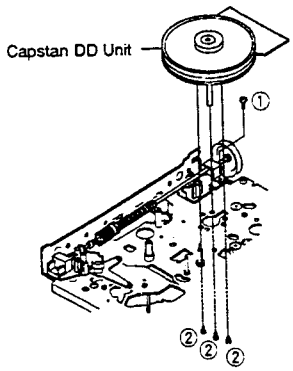


Fig. 2-15

2-16: INCLINED T ASS'Y / INCLINED S ASS'Y (Refer to Fig. 2-16)

1. Remove the 2 Slider Loadings.
2. Remove the Inclined T Ass'y and Inclined S Ass'y.
3. Remove the Loading Gear T Ass'y.
4. Remove the Loading Gear S Ass'y.

NOTE

When installing the Inclined T Ass'y and Inclined S Ass'y, align the timing marks.

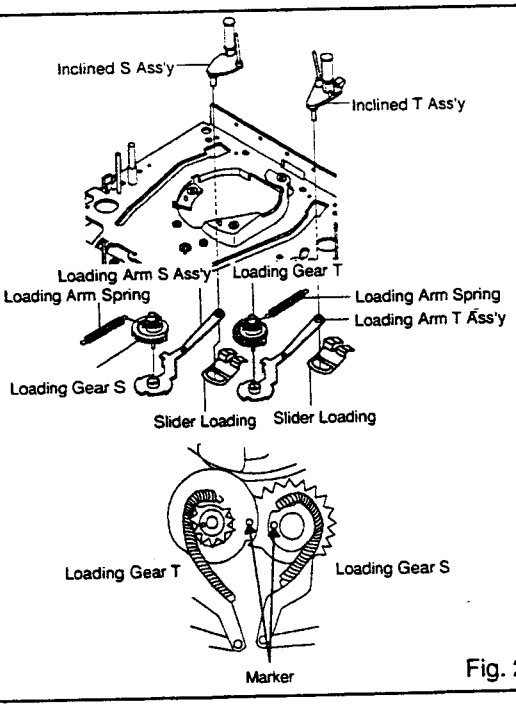


Fig. 2-16

KEY TO ABBREVIATIONS

A	A/C	:	Audio/Control
	ACC	:	Automatic Color Control
	AE	:	Audio Erase
	AFC	:	Automatic Frequency Control
	AFT	:	Automatic Fine Tuning
	AFT DET	:	Automatic Fine Tuning Detect
	AGC	:	Automatic Gain Control
	AMP	:	Amplifier
	ANT	:	Antenna
	A.PB	:	Audio Playback
	APC	:	Automatic Phase Control
	ASS'Y	:	Assembly
	AT	:	All Time
	AUTO	:	Automatic
	A/V	:	Audio/Video
B	BGP	:	Burst Gate Pulse
	BOT	:	Beginning of Tape
	BPF	:	Bandpass Filter
	BRAKE SOL	:	Brake Solenoid
	BUFF	:	Buffer
	B/W	:	Black and White
C	C	:	Capacitance, Collector
	CASE	:	Cassette
	CAP	:	Capstan
	CARR	:	Carrier
	CH	:	Channel
	CLK	:	Clock
	CLOCK (SY-SE)	:	Clock (Syscon to Servo)
	COMB	:	Combination, Comb Filter
	CONV	:	Converter
	CPM	:	Capstan Motor
	CTL	:	Control
	CYL	:	Cylinder
	CYL-M	:	Cylinder-Motor
	CYL SENS	:	Cylinder-Sensor
D	DATA (SY-CE)	:	Data (Syscon to Servo)
	dB	:	Decibel
	DC	:	Direct Current
	DD Unit	:	Direct Drive Motor Unit
	DEMOD	:	Demodulator
	DET	:	Detector
	DEV	:	Deviation
E	E	:	Emitter
	EF	:	Emitter Follower
	EMPH	:	Emphasis
	ENC	:	Encoder
	ENV	:	Envelope
	EOT	:	End of Tape
	EQ	:	Equalizer
	EXT	:	External
F	F	:	Fuse
	FBC	:	Feed Back Clamp
	FE	:	Full Erase
	FF	:	Fast Forward, Flipflop
	FG	:	Frequency Generator
	FL SW	:	Front Loading Switch
	FM	:	Frequency Modulation
	FSC	:	Frequency Sub Carrier
	FWD	:	Forward
G	GEN	:	Generator
	GND	:	Ground
H	H.P.F	:	High Pass Filter
	H.SW	:	Head Switch
	Hz	:	Hertz
I	IC	:	Integrated Circuit
	IF	:	Intermediate Frequency
	IND	:	Indicator
	INV	:	Inverter
K	KIL	:	Killer
L	L	:	Left
	LED	:	Light Emitting Diode
	LIMIT AMP	:	Limiter Amplifier
	LM, LDM	:	Loading Motor
	LP	:	Long Play
	L.P.F	:	Low Pass Filter
	LUMI.	:	Luminance
M	M	:	Motor
	MAX	:	Maximum
	MINI	:	Minimum
	MIX	:	Mixer, mixing
	MM	:	Monostable Multivibrator
	MOD	:	Modulator, Modulation
	MPX	:	Multiplexer, Multiplex
	MS SW	:	Mech State Switch
N	NC	:	Non Connection
	NR	:	Noise Reduction
O	OSC	:	Oscillator
	OPE	:	Operation
P	PB	:	Playback
	PB CTL	:	Playback Control
	PB-C	:	Playback-Chrominance
	PB-Y	:	Playback-Luminance
	PCB	:	Printed Circuit Board
	P. CON	:	Power Control
	PD	:	Phase Detector
	PG	:	Pulse Generator
	P-P	:	Peak-to Peak
R	R	:	Right
	REC	:	Recording
	REC-C	:	Recording-Chrominance
	REC-Y	:	Recording-Luminance
	REEL BRK	:	Reel Brake
	REEL S	:	Reel Sensor
	REF	:	Reference
	REG	:	Regulated, Regulator
	REW	:	Rewind
	REV, RVS	:	Reverse
	RF	:	Radio Frequency
	RMC	:	Remote Control
	RY	:	Relay
S	S. CLK	:	Serial Clock
	S. COM	:	Sensor Common
	S. DATA	:	Serial Data
	SEG	:	Segment
	SEL	:	Select, Selector
	SENS	:	Sensor
	SER	:	Search Mode
	SI	:	Serial Input
	SIF	:	Sound Intermediate Frequency
	SO	:	Serial Output
	SOL	:	Solenoid
	SP	:	Standard Play
	STB	:	Serial Strobe
	SW	:	Switch

KEY TO ABBREVIATIONS

S	**SYNC**	:	Synchronization
	SYNC SEP	:	Sync Separator, Separation
T	**TR**	:	Transistor
	TRAC	:	Tracking
	TRICK PB	:	Trick Playback
	TP	:	Test Point
U	**UNREG**	:	Unregulated
V	**V**	:	Volt
	VCO	:	Voltage Controlled Oscillator
	VIF	:	Video Intermediate Frequency
	VP	:	Vertical Pulse, Voltage Display
	V.PB	:	Video Playback
	VR	:	Variable Resistor
	V.REC	:	Video Recording
	VSF	:	Visual Search Fast Forward
	VSR	:	Visual Search Rewind
	VSS	:	Voltage Super Source
	V-SYNC	:	Vertical-Synchronization
	VT	:	Voltage Tuning
X	**X'TAL**	:	Crystal
Y	**Y/C**	:	Luminance/Chrominance

PREVENTIVE CHECKS AND SERVICE INTERVALS

The following standard table depends on environmental conditions and usage. Unless maintenance is properly carried out, the following service intervals may be quite shortened as harmful effects may be had on other parts. Also, long term storage or misuse may cause transformation and aging of rubber parts.

Time / Parts Name	500 hours	1,000 hours	1,500 hours	2,000 hours	3,000 hours	Notes
Audio Control Head	■	■	■	■	■	Clean those parts in contact with the tape.
Full Erase Head	■	■	■	■	■	
Loading Motor Belt		■		●		Clean the rubber, and parts which the rubber touches.
Reel Belt		■		●		
Pinch Roller	■	■	■	■	■ ●	
Capstan DD Unit					●	
Loading Motor					●	
Tension Band					●	
Capstan Shaft	■	■	■	■	■	
Tape Running Guide Post	■	■	■	■	■	Replace when rolling becomes abnormal.
Cylinder Unit	■	■ ●	■	■ ●	■ ●	Clean the Head.

● : Replace ■ : Clean

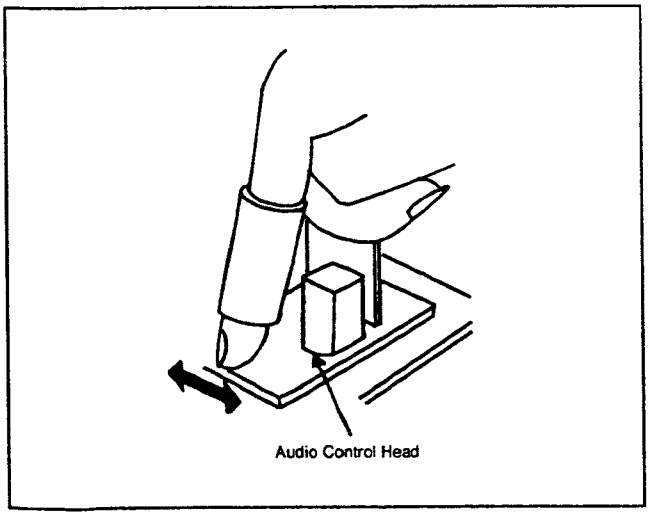
CLEANING

NOTE

- After cleaning the heads with isopropyl alcohol, do not run a tape until the heads dry completely. If the heads are not completely dry and alcohol gets on the tape, damage may occur.

1. AUDIO CONTROL HEAD

- Wrap a piece of chamois around your finger. Dip it in isopropyl alcohol and clean the audio control head by wiping it horizontally. Clean the full erase head in the same manner. **(Refer to the figure below)**



2. TAPE RUNNING SYSTEM

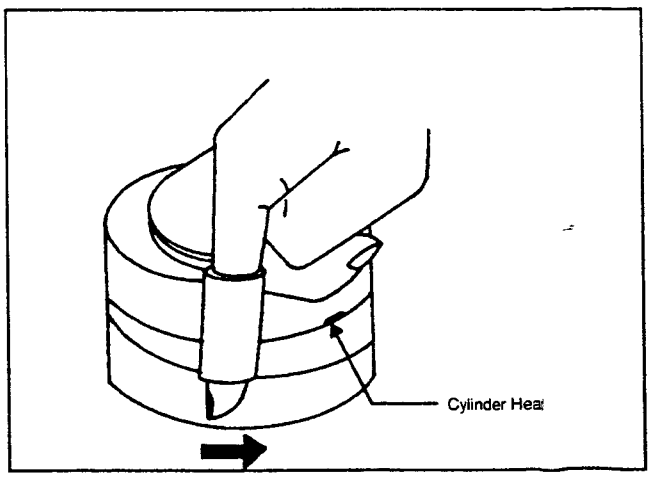
- When cleaning the tape transport system, use the gauze moistened with isopropyl alcohol.

3. CYLINDER

- Wrap a piece of chamois around your finger. Dip it in isopropyl alcohol. Hold it to the cylinder head softly. Turn the cylinder head counterclockwise to clean it (in the direction of the arrow). **(Refer to the figure below)**

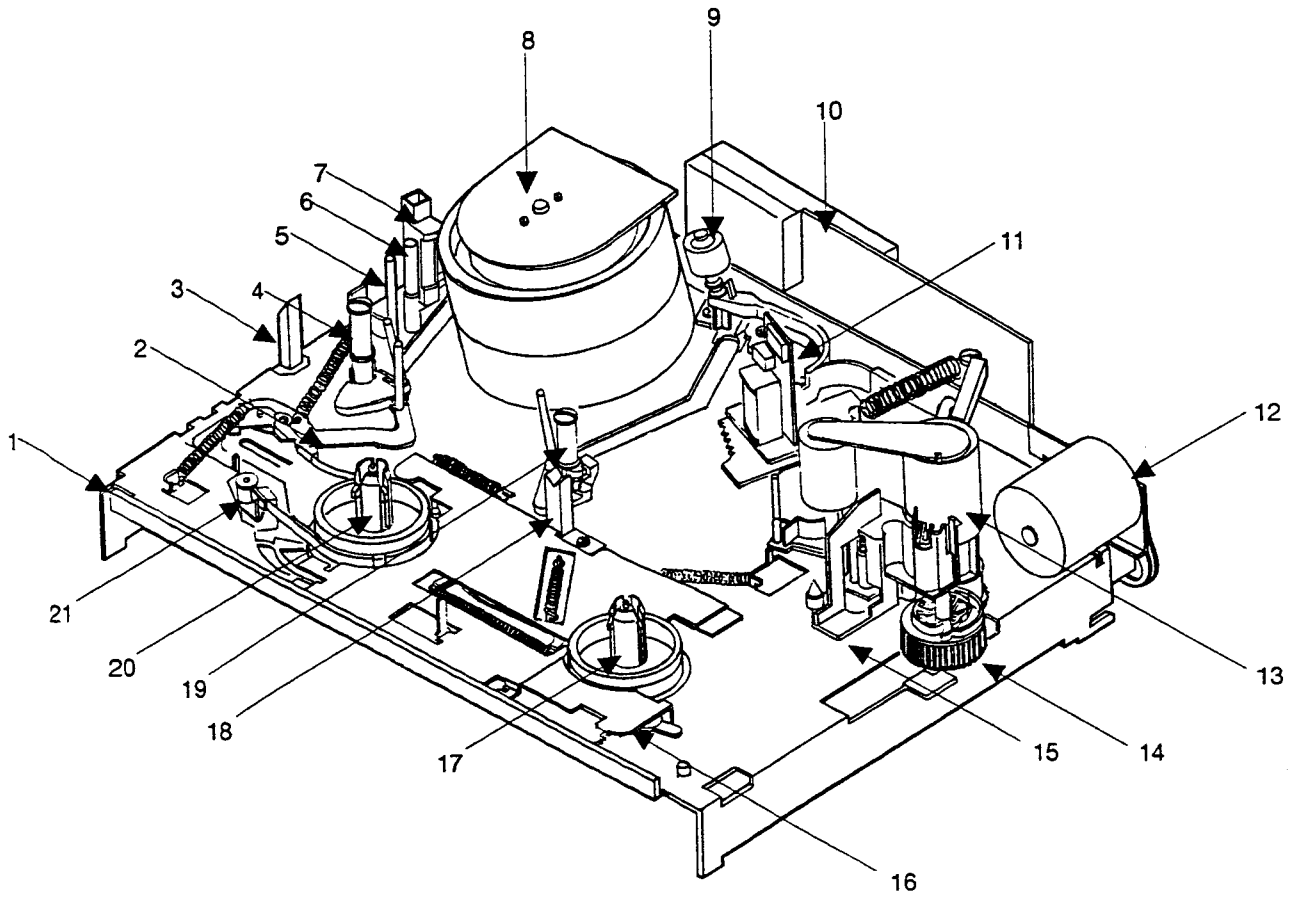
NOTE

Do not exert force against the cylinder head. Do not move the chamois up or down since this can damage the head. Always use a piece of chamois for cleaning.



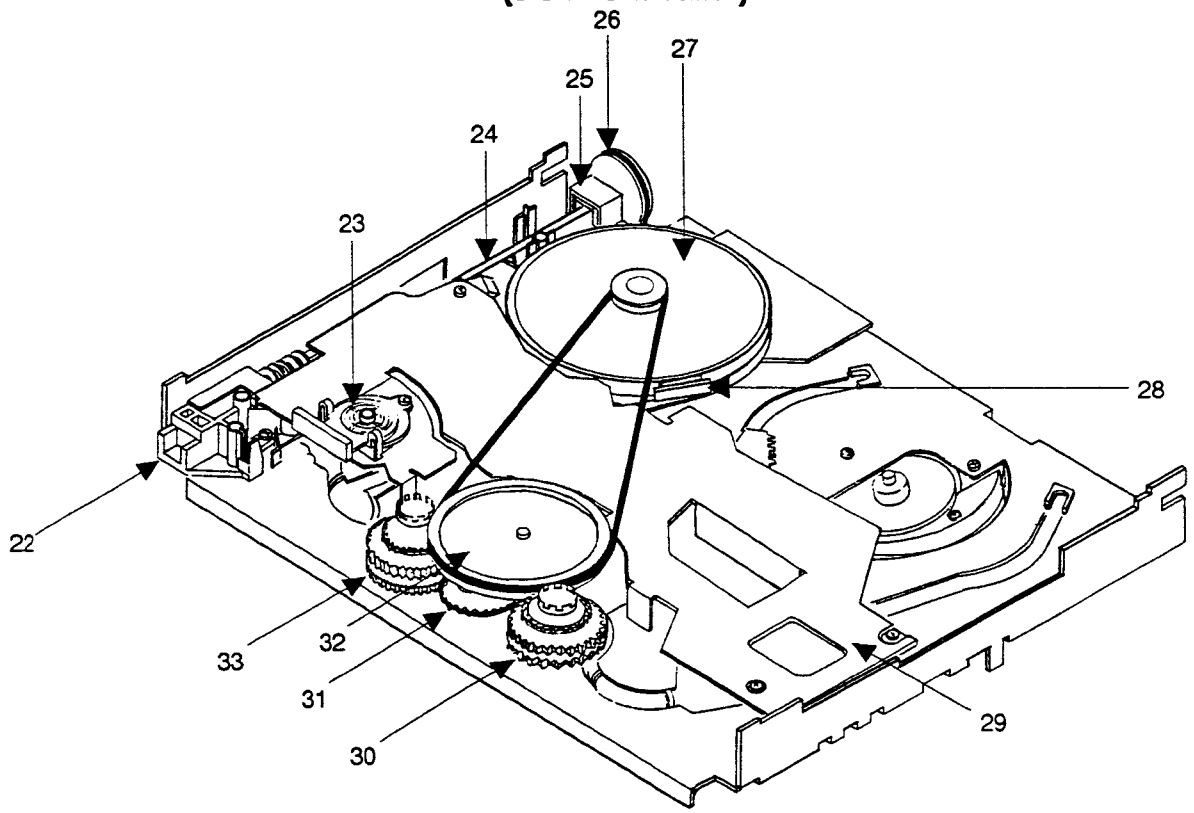
DECK PARTS LOCATIONS

(TOP VIEW)



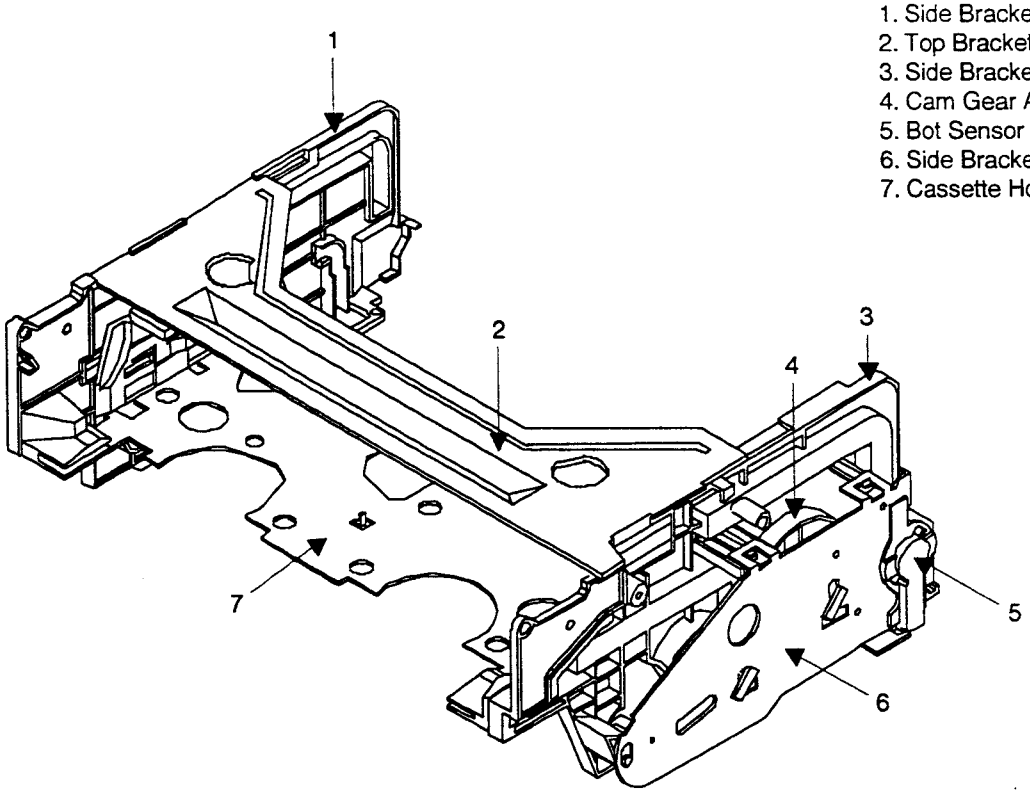
1. Main Chassis
2. Tension Arm Ass'y
3. EOT Reflector
4. Guide Roller S Ass'y
5. P0 Post
6. P1 Post
7. FE Head
8. Cylinder Unit
9. Auto Head Cleaning
10. Head Amp PCB
11. Audio/Control Head
12. Loading Motor
13. Pinch Roller Block
14. Cam Gear
15. Cassette Opener
16. Brake Bracket
17. Reel
18. LED Reflector
19. Guide Roller T Ass'y
20. Reel
21. Tension Band Ass'y

DECK PARTS LOCATIONS
(BOTTOM VIEW)



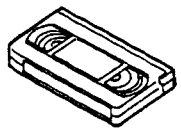
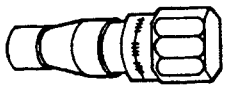
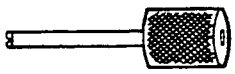
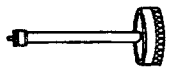
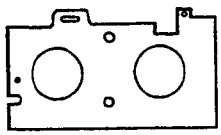
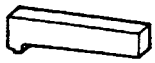
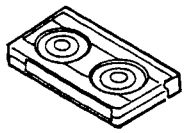
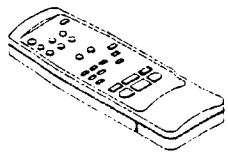
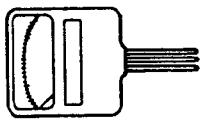
22. Worm Bracket F Ass'y
23. Mode Switch
24. Worm Ass'y
25. Worm Bracket R Ass'y
26. Loading Motor Belt
27. Capstan DD Unit
28. Capstan Brake Ass'y
29. Bottom Plate
30. Clutch Gear S Ass'y
31. Idler Arm Ass'y
32. Center Pulley
33. Clutch Gear T Ass'y

(UNIT ASS'Y)



1. Side Bracket L
2. Top Bracket Ass'y
3. Side Bracket R Ass'y
4. Cam Gear Ass'y
5. Bot Sensor Cover
6. Side Bracket R2
7. Cassette Holder Ass'y

SERVICING FIXTURES AND TOOLS

VHS Alignment Tape JG001E (VP1S-LI6[3]) JG001F (VP1S-C01[3]) 	JG002B Adapter JG002F Dial Torque Gauge (60~600gr/cm) JG002G (100~1200gr/cm) 	JG005 Post Adjustment Screwdriver Part No. SV-TG0-030-000 (small) 	JG153 X Value Adjustment Screwdriver 
JG022 Master Plane 	JG024 Reel Disk Height Adjustment Jig 	JG100A Torque Tape (VHT-063) 	JG155 Remote Control 
Tentelometer 			

Part No.	Remarks
JG001E	Monoscope, 6KHz
JG001F	Color Bar, 1KHz
JG002F	Playback Take Up Torque
JG002G	Fast Forward Torque, Rewind Torque, Brake Torque (Take up Reel/Supply Reel)
JG005	Guide Roller Adjustment
JG153	X-Value Adjustment
JG022/JG024	Reel Disk Height Adjustment
JG100A	Playback Back Tension Torque
JG155	Used for PG SHIFTER Adjustment

TO CHECK INITIAL SETTING

NOTE: If there is an error in the data, the unit may indicate malfunction.

INSTRUCTIONS

1. Turn on the POWER and press both FF key and CH UP key on the set simultaneously for more than 2 seconds. The Initial Set Mode indicator will appear and the Address will blink. **(Refer to Fig. 1)**
2. Press the SET +/- button on the remote control to modify the address and check the data of each addresses are correct. **(Refer to Table 1)**
3. After checking, turn off the Power.

(If the wrong data is input)

4. Press the SET +/- button on the remote control to set to the address of the wrong data, then press the ENTER button. The data will bink. **(Refer to Fig. 1)**
5. Press the SET +/- button on the remote control to set to the correct data, then press the ENTER button. **(Refer to Table 1)**
6. Repeat the above steps 4 and 5 and input the data into the each Address.
7. After the data input, turn off the Power.

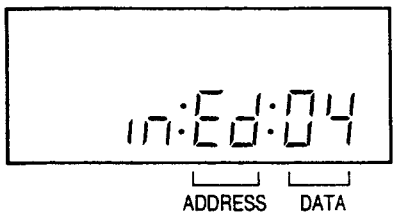


Fig. 1

ADDRESS	INI ED	INI EE	INI EF	INI F0	INI F1	INI F2	INI F3	INI F4	INI F5	INI F6	INI F7	INI F8	INI F9	INI FA	INI FB	INI FC	INI FD	INI FE
DATA	02	82	84	06	02	05	40	00	00	A1	9B	13	00	E0	ED	0F	EE	09

Table 1

MECHANICAL ADJUSTMENTS

1. CONFIRMATION AND ADJUSTMENT

Read the following NOTED items before starting work.

* Place an object which weighs between 350g and 500g on the Cassette Tape to keep it steady when you want to make the tape run without the Unit Ass'y. (Do not place an object which weighs over 500g.)
* When you activate the deck without the Unit Ass'y, short circuit between **TP1010** and **TP1011**. In this condition the BOT/EOT/Reel Sensor will not function.

1-1: CONFIRMATION AND ADJUSTMENT OF REEL DISK HEIGHT

1. Turn on the power and set to the STOP mode.
2. Set the master plane **(JG022)** and reel disk height adjustment jig **(JG024)** on mechanism framework, taking care not to scratch the drum, as shown in **Fig. 1-1-A.**
3. Confirm that the reel disk is lower than "A" of the reel disk height adjustment jig **(JG024)** on the master plane and higher than "B" as shown in **Fig. 1-1-B.** If it is not, adjust to less than 7.5mm± 0.2mm with the height adjustment washer.
4. Perform the same adjustment for other reel.

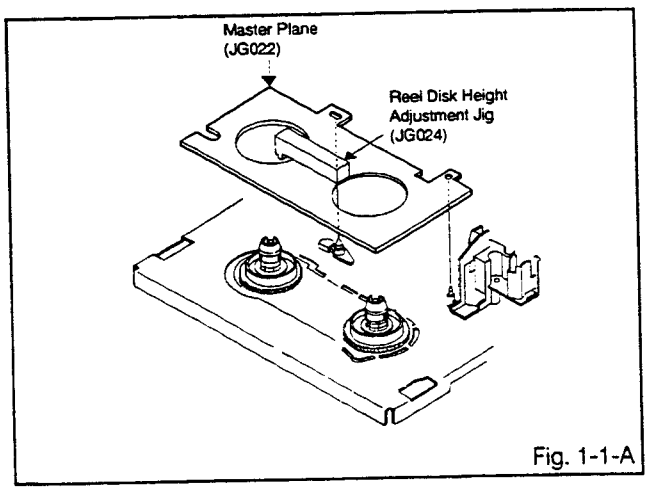


Fig. 1-1-A

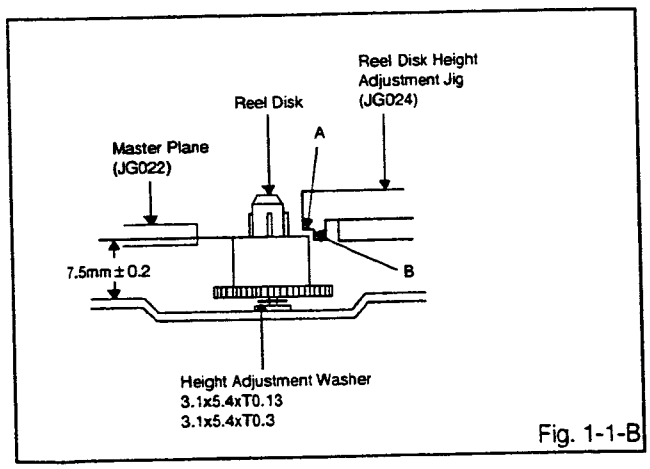


Fig. 1-1-B

1-2: CONFIRMATION AND ADJUSTMENT OF TENSION POST POSITION

1. Turn on the power and set to the PLAY mode adjust the Tension so that the Tension Post is at the position of 0.3mm~0.5mm from the Rib. **(Refer to Fig. 1-2)**
2. Confirm that the video tape is not curling at the flange of P1 post or is not running on flanges.

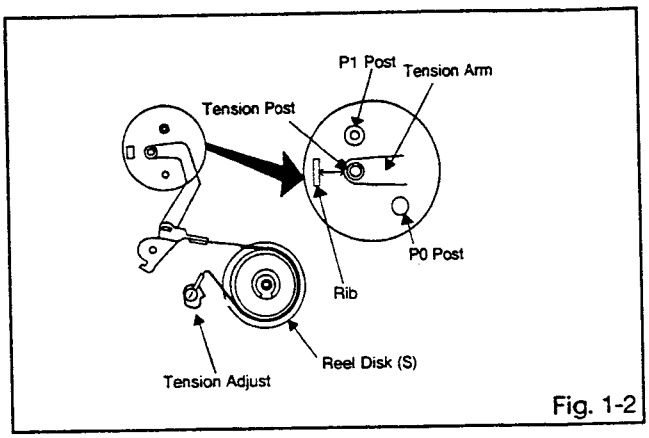


Fig. 1-2

1-3: CONFIRMATION AND ADJUSTMENT OF BACK TENSION ON PLAYBACK

1. Load a video tape recorded in standard speed mode. Set the unit to the PLAY mode.
2. Install the tentelometer as shown in **Fig. 1-3.** Confirm the value is within 20~27gr/cm at this time.

※ IN CASE OF USING A CASSETTE TYPE TORQUE TAPE.

1. After adjustment, confirm and adjust the tension post position **(Refer to item 1-2)** for the tension arm, install the cassette type torque tape **(JG100A)** and set to the PLAY mode.
2. Confirm that the left hand side tension value of the torque tape is 25~38gr/cm for the standard mode tape.

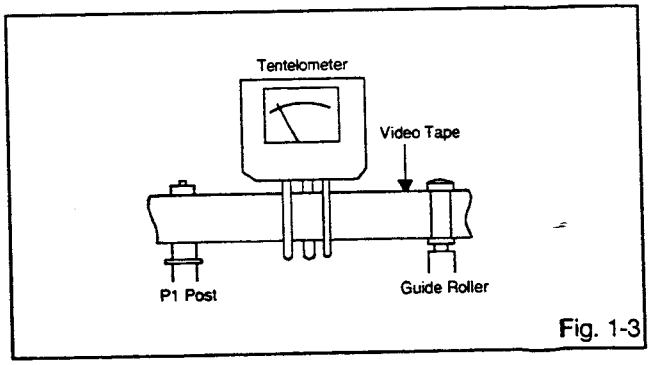


Fig. 1-3

MECHANICAL ADJUSTMENTS

1-4: CONFIRMATION OF FAST FORWARD TORQUE

1. Set torque gauge **(JG002G)** on take-up reel disk, and place unit in FAST FORWARD mode. **(Refer to Fig. 1-4)**
2. Confirm that torque is more than 400gr/cm.

NOTE

After setting the torque gauge on the reel disk, hold the gauge in place.
Push the FAST FORWARD button and the reel disk will begin to turn.

1-5: CONFIRMATION OF REWIND TORQUE

1. Operate within 4 or 5 seconds after the reel disk begins to turn.
2. Set torque gauge **(JG002G)** on supply reel disk, and place the unit in REWIND mode. **(Refer to Fig 1-4).**
3. Confirm that torque is more than 400gr/cm.

NOTE

After setting the torque gauge on the reel disk, hold the gauge in place.
Push the REWIND button and the reel disk will begin to turn.

1-6: CONFIRMATION OF REEL BRAKE TORQUE

(Take-Up Reel Brake) **(Refer to Fig. 1-4)**

1. Set to STOP mode.
2. Set the torque gauge **(JG002G)** to the take-up reel and turn it counterclockwise.
3. Confirm that it is more than 200gr/cm at that time.

(Supply Reel Brake) **(Refer to Fig. 1-4)**

1. Set to STOP mode.
2. Set the torque gauge **(JG002G)** to the supply reel and turn it clockwise.
3. Confirm that it is more than 200gr/cm at that time.

NOTE

Separate the idler from the reel and confirm the brake torque.

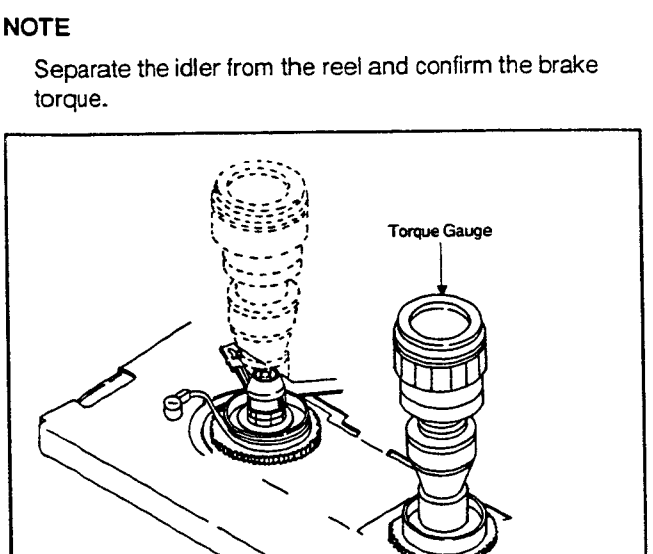


Fig. 1-4

NOTE

If the torque value checked is out of tolerance, replace the appropriate parts as follows.

Check Items	Replace Parts
1-4	Idler Ass'y or Clutch ASS'Y
1-5	Idler Ass'y or Clutch ASS'Y
1-6	Main Brake T Ass'y or Main Brake S Ass'y

2. TAPE RUNNING CONFIRMATION AND ADJUSTMENT

Tape running is adjusted precisely at the factory. Normally, it is not necessary to make adjustments. It is necessary to confirm and make adjustments when the parts of the tape running mechanism are replaced because of extensive usage or failure.

2-1: GUIDE ROLLER

1. Connect CH-1 on the oscilloscope to **TP4002 (PB Envelope)** and CH-2 to **TP4001 (SW Pulse)**.
2. Set the tracking to manual center position in the following way. Hold and press the tracking auto button more than 2 seconds to set the tracking to center position.
3. Trigger with SW pulse and observe the envelope. **(Refer to Fig. 2-1-A)**
4. Adjust the guide roller height while observing the envelope, and make the envelope flat. Adjust the envelope so that the flatness will not be affected even when the tracking control button is pressed. (Use the adjustment screwdriver **JG005**).
5. Press and hold the tracking control button and (at the point that the envelope waveform starts to reduce) adjust the envelope so that the A : B ratio is better than 3 : 2. **(Refer to Fig. 2-1-B)**
6. Adjust the PG shifter **(ELECTRICAL ADJUSTMENTS : ITEM 3-1)** in the PLAY mode.

NOTE

After adjustment, confirm and adjust A/C head tilt. **(Refer to item 2-2)**

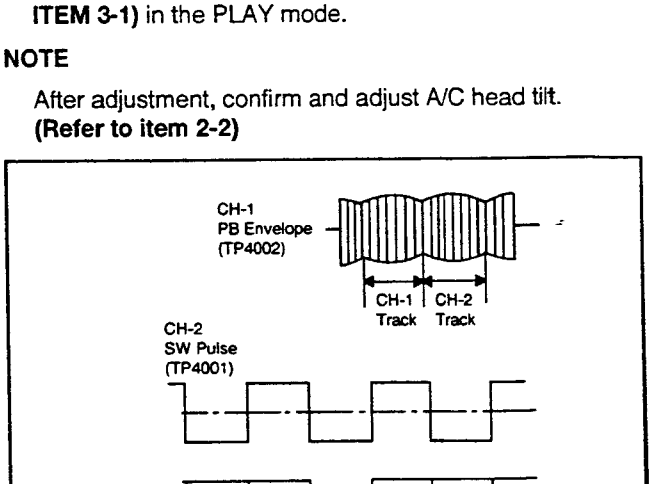


Fig. 2-1-A

MECHANICAL ADJUSTMENTS

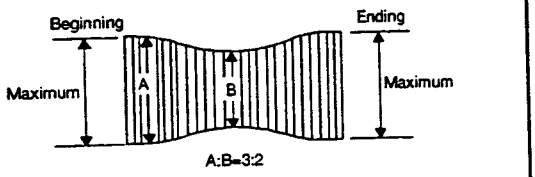


Fig. 2-1-B

2-2: CONFIRMATION AND ADJUSTMENT OF A/C HEAD TILT

When the tape is running abnormally, perform the following adjustments.

1. Insert a new tape and play it back.
2. Confirm that there is no crease on the tape between the P4 post and guide roller (R) and the tape is running smoothly. (It is absolutely impossible to get satisfactory sound if the tape is distorted between the A/C head and P4 post.)
3. If the tape still does not run smoothly, turn the screw ① and adjust the tilt of the A/C head. **(Refer to Fig. 2-2)**

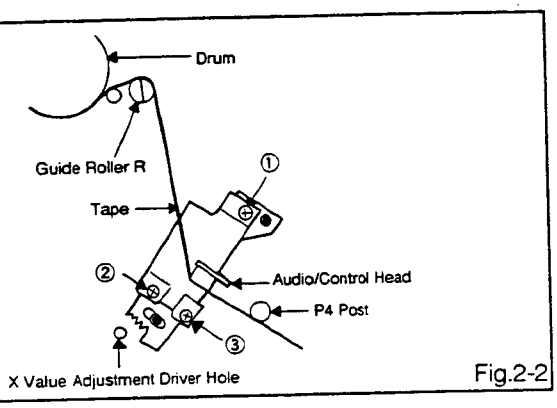


Fig.2-2

2-3: ADJUSTMENT OF A/C HEAD HEIGHT AND AZIMUTH

1. Playback a VHS alignment tape **(JG001E)** and observe the waveform at the audio output terminal.
2. Turn the screw ② slowly to change the azimuth of the A/C head. Adjust the height so that the audio output becomes maximum. **(Refer to Fig. 2-2)**
3. Adjust the screw ③, **(Refer to Fig. 2-2)** until the height of the A/C head reaches the position against the tape as shown in **Fig. 2-3.**
4. When the control head height is not correct. (When you must turn the screw more than 45 degrees), Turn all of the screws ①, ② and ③ to the same degrees. Then confirm the angle of the audio/control head and adjust again.

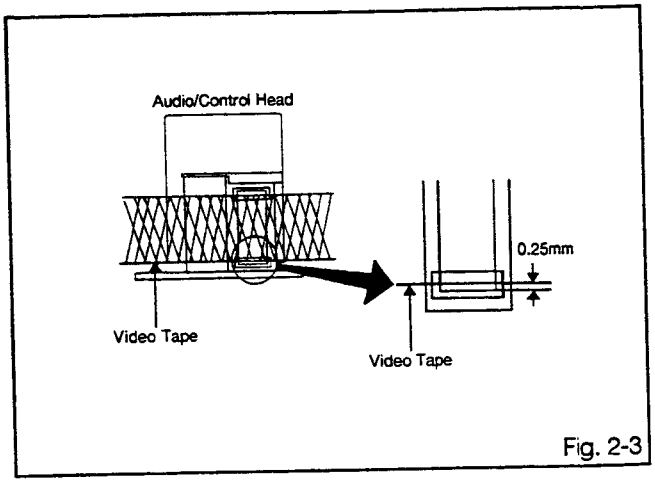


Fig. 2-3

2-4: TAPE RUNNING ADJUSTMENT

1. Adjust the height of reel disk. **(Refer to item 1-1)**
2. Confirm and adjust tension post position. **(Refer to item 1-2)**
3. Adjust the guide roller. **(Refer to item 2-1)**
4. Adjust the A/C head tilt. **(Refer to item 2-2)**
5. Adjust the A/C head height and azimuth. **(Refer to item 2-3)**
6. Connect CH-1 on the oscilloscope to **TP4001** and CH-2 to **TP4002.** Playback the VHS alignment tape **(JG001E).** Set the tracking to manual center. Adjust X with the screw driver for X **(JG153)** as the **Fig. 2-1-A** and **Fig. 2-1-B.** **(Refer to No. 2 of the item 2-1).**

ELECTRICAL ADJUSTMENTS

3. ADJUSTMENT PROCEDURE

Read and perform these adjustments when repairing the circuits or replacing electrical parts or PCB assemblies.

CAUTION

When replacing IC's or transistors, use only specified silicon grease **(YG6260M)**.
(To prevent the damage to IC's and transistors.)

3-1: PG SHIFTER

CONDITIONS

MODE-PLAYBACK
Input Signal-Alignment Tape **(JG001F)**

INSTRUCTIONS

1. Playback the alignment tape. **(JG001F)**
2. Press the PLAY button on the set for more than 3 seconds. If the indicator ATR disappear's, the adjustment is finished.

(If the above adjustments doesn't work well:)

1. Connect CH-1 on the oscilloscope to **TP4001** and CH-2 to **Pin 19 of J4501.**
2. Press the PG AUTO key. **(JG155)**
3. While the ATR indicator is flashing, press the PG MANUAL key. **(JG155)**
4. Adjust the Tracking +/– key until waveform of the oscilloscope measures 6.5 ± 0.5(H) at both leading and trailing edges. **(Refer to Fig. 3-1-A, B)**
5. Press the Tracking Auto key.

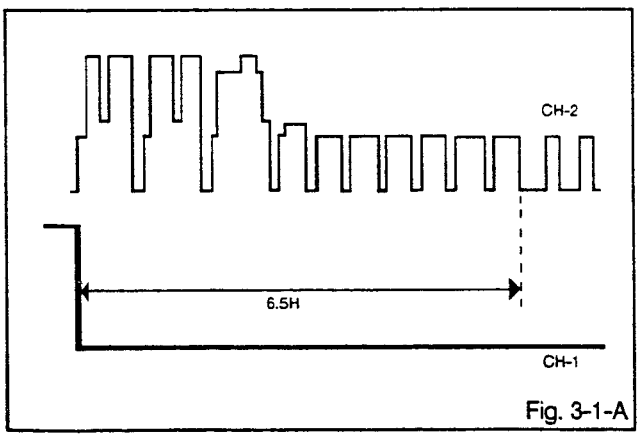


Fig. 3-1-A

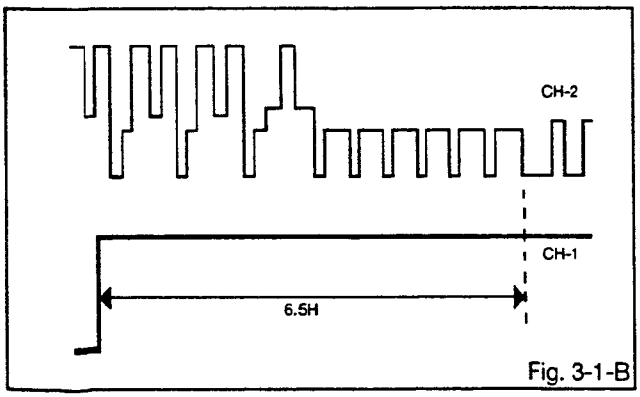


Fig. 3-1-B

3-2: PILOT

CONDITIONS

MODE-TUNER
AUDIO OUTPUT SW : STEREO POSITION
Input Signal-RF Signal

INSTRUCTIONS

1. Receive the audio signal (L ch: 1KHz, R ch: 3KHz).
2. Connect the oscilloscope to **TP6603.**
3. Adjust **L6604** until the waveform becomes as shown in **Fig. 3-2.**

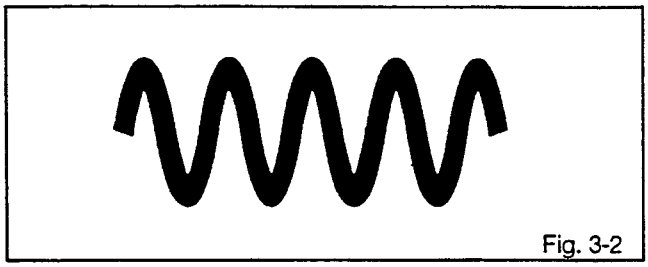


Fig. 3-2

3-3: SEPARATION

CONDITIONS

MODE-STOP
AUDIO OUTPUT SW : STEREO POSITION
Input Signal-RF Signal

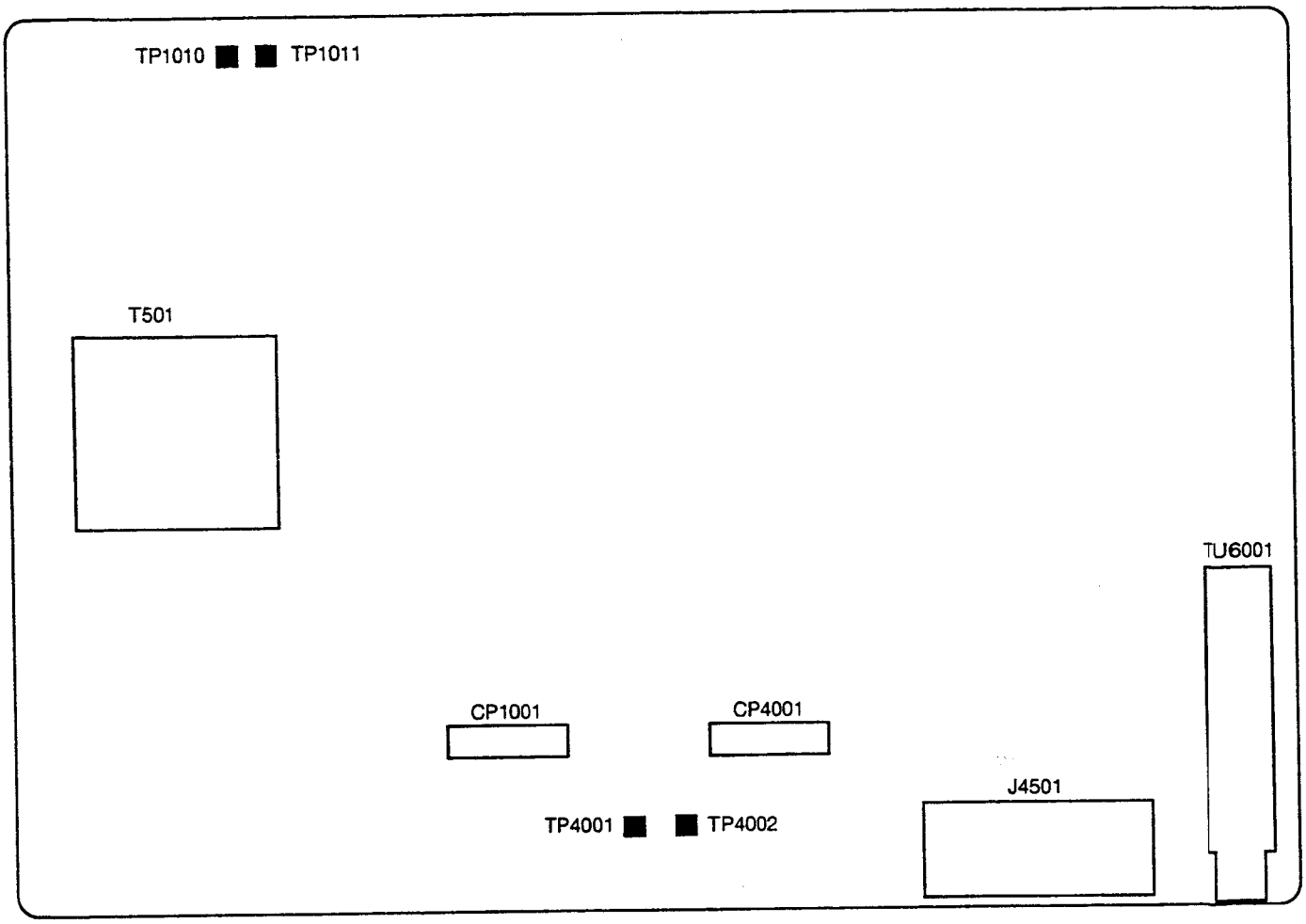
INSTRUCTIONS

1. Receive the audio signal (L ch: No Signal, R ch: 1KHz).
2. Connect the AC voltmeter to **AUDIO OUT (L ch).**
3. Press the PLAY button on the set for more than 2 seconds. The fluorescent display on the set displays as below.

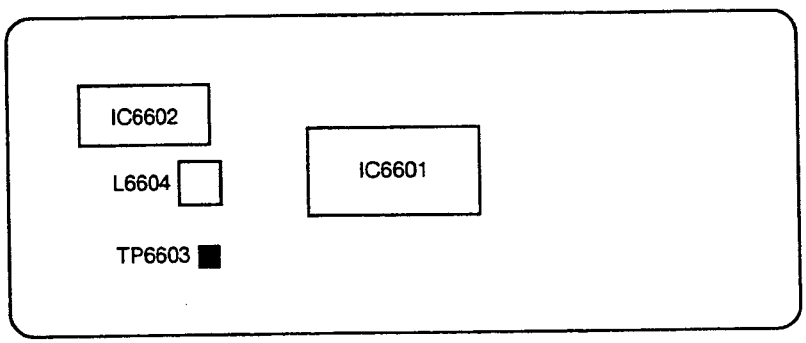
4. Press the PLAY button on the set for more than 2 seconds. The fluorescent display on the set displays as below.

5. Adjust the Set +/- key on the remote control until output signal is minimum. (more than 30dB)
6. Press the PLAY button on the set for more than 2 seconds to complete the adjustment.
7. Receive the audio signal (L ch: 1KHz, R ch: No Signal).
8. Connect the AC voltmeter to **AUDIO OUT (R ch).**
9. Repeat steps 3 ~ 6.

MAJOR COMPONENTS LOCATION GUIDE

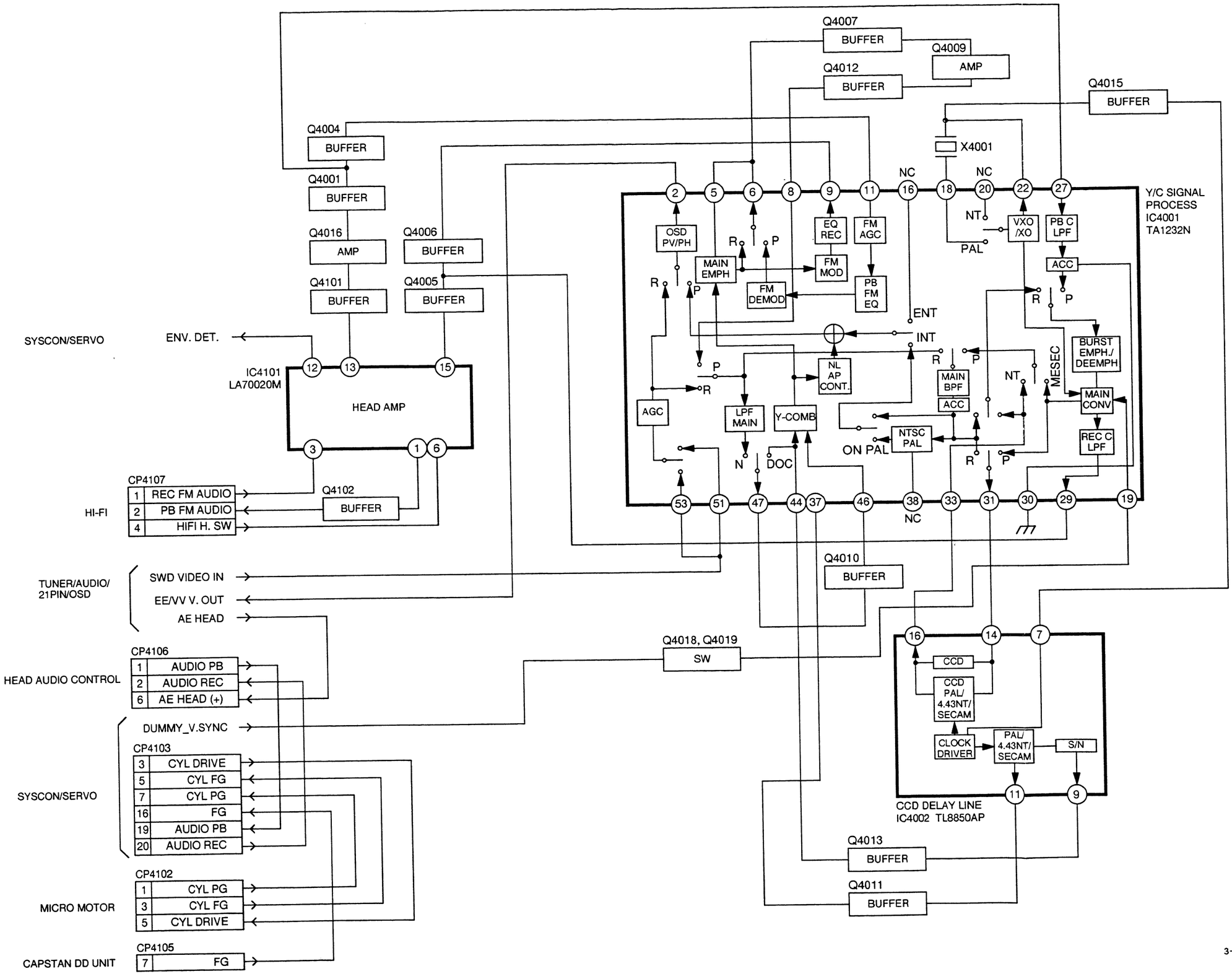


MAIN



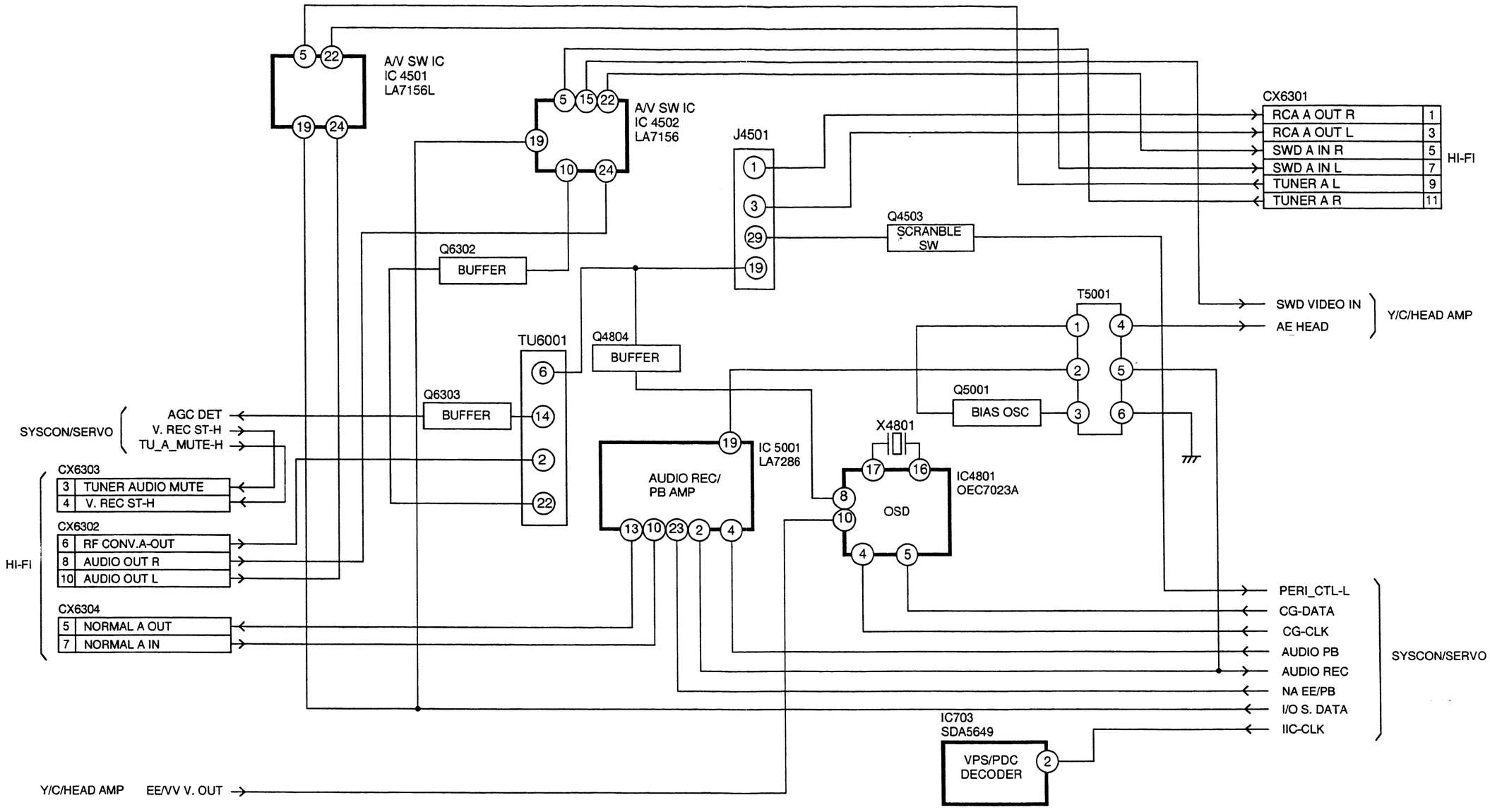
HI-FI

Y/C／HEAD AMP BLOCK DIAGRAM



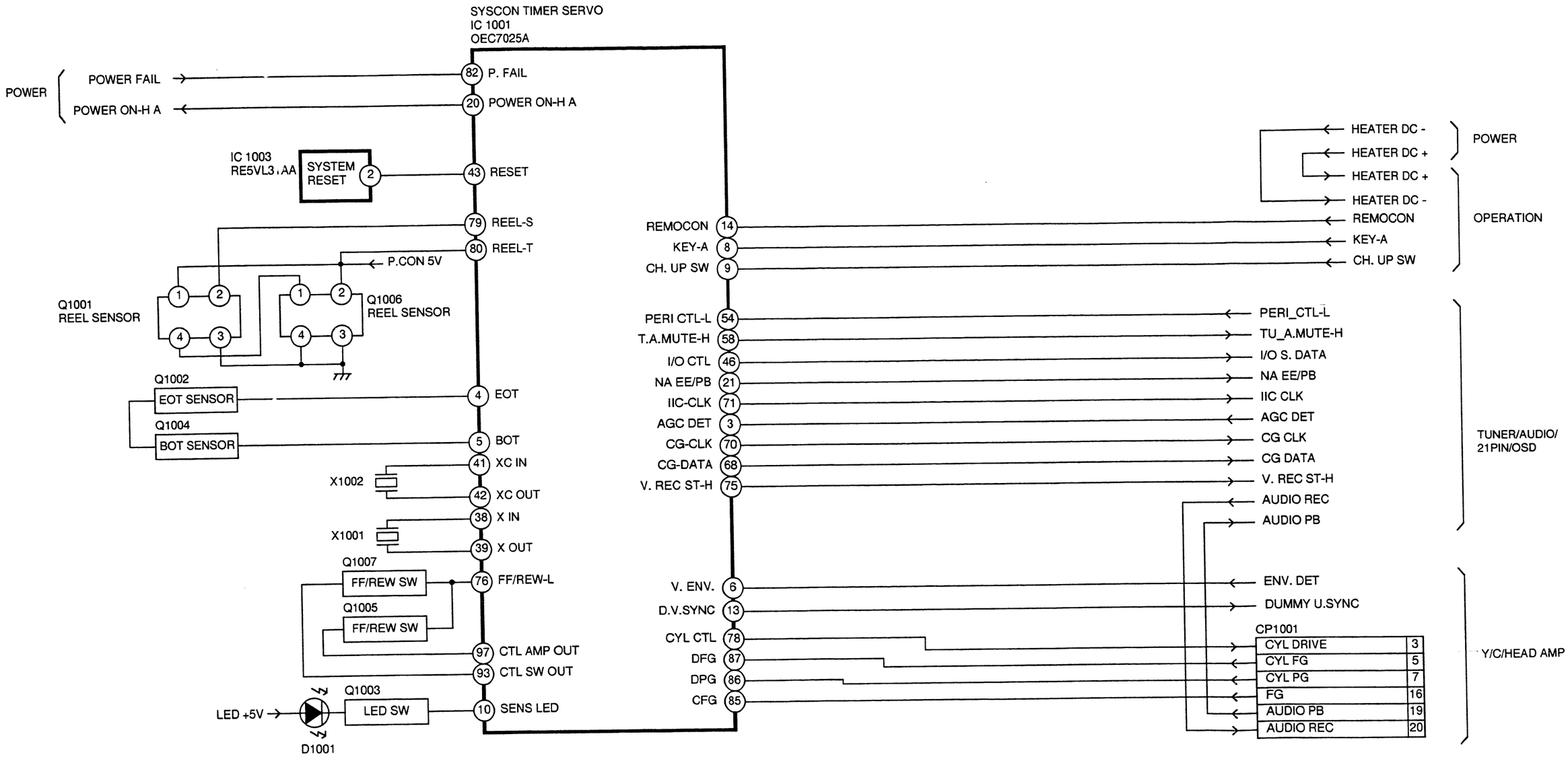
3-6268

TUNER／AUDIO／21PIN／OSD BLOCK DIAGRAM



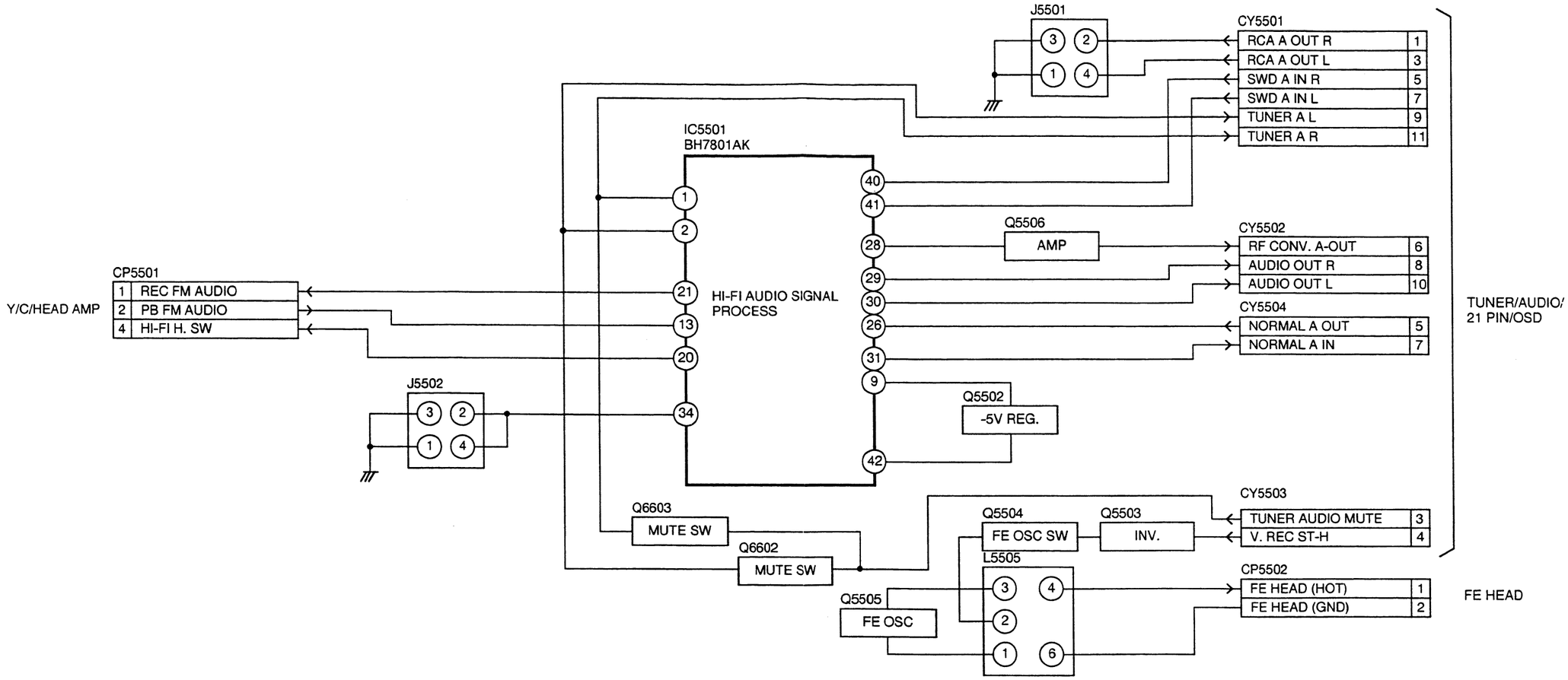
3-6271

SYSTEM CONTROL/SERVO BLOCK DIAGRAM



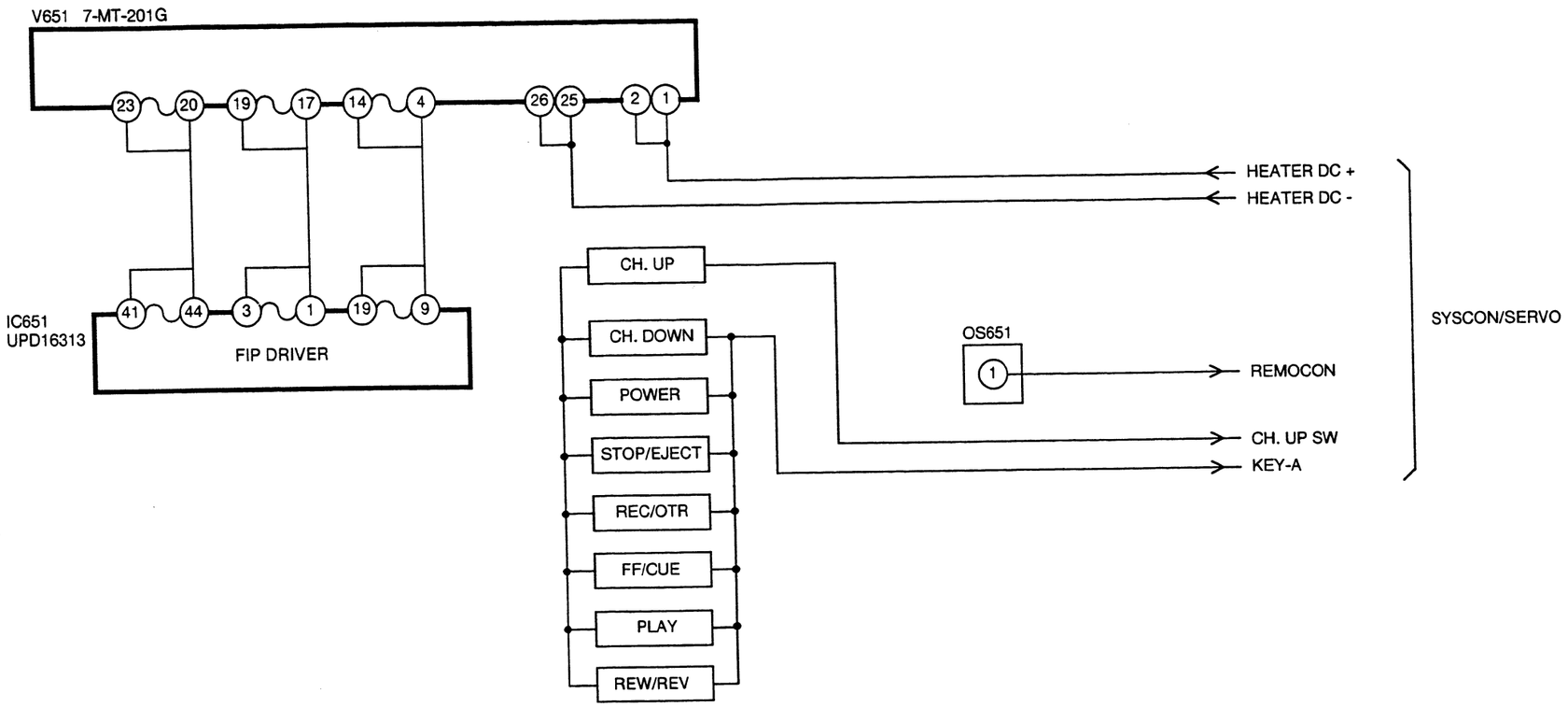
3-6269

HI-FI BLOCK DIAGRAM

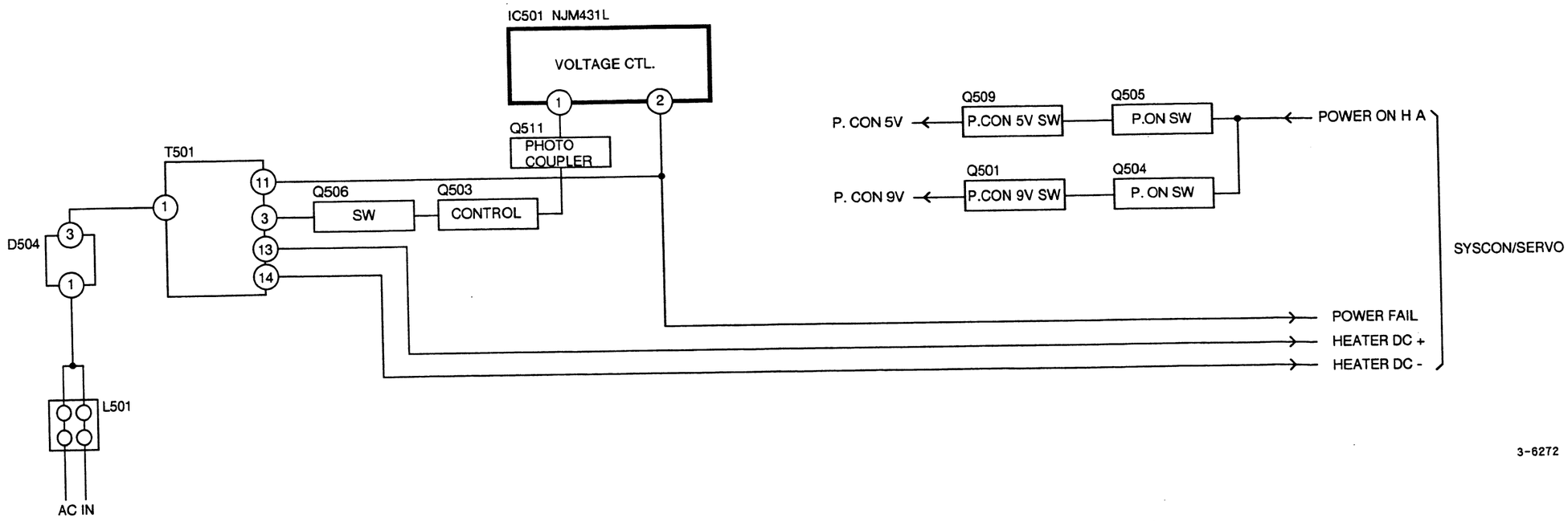


3-6270

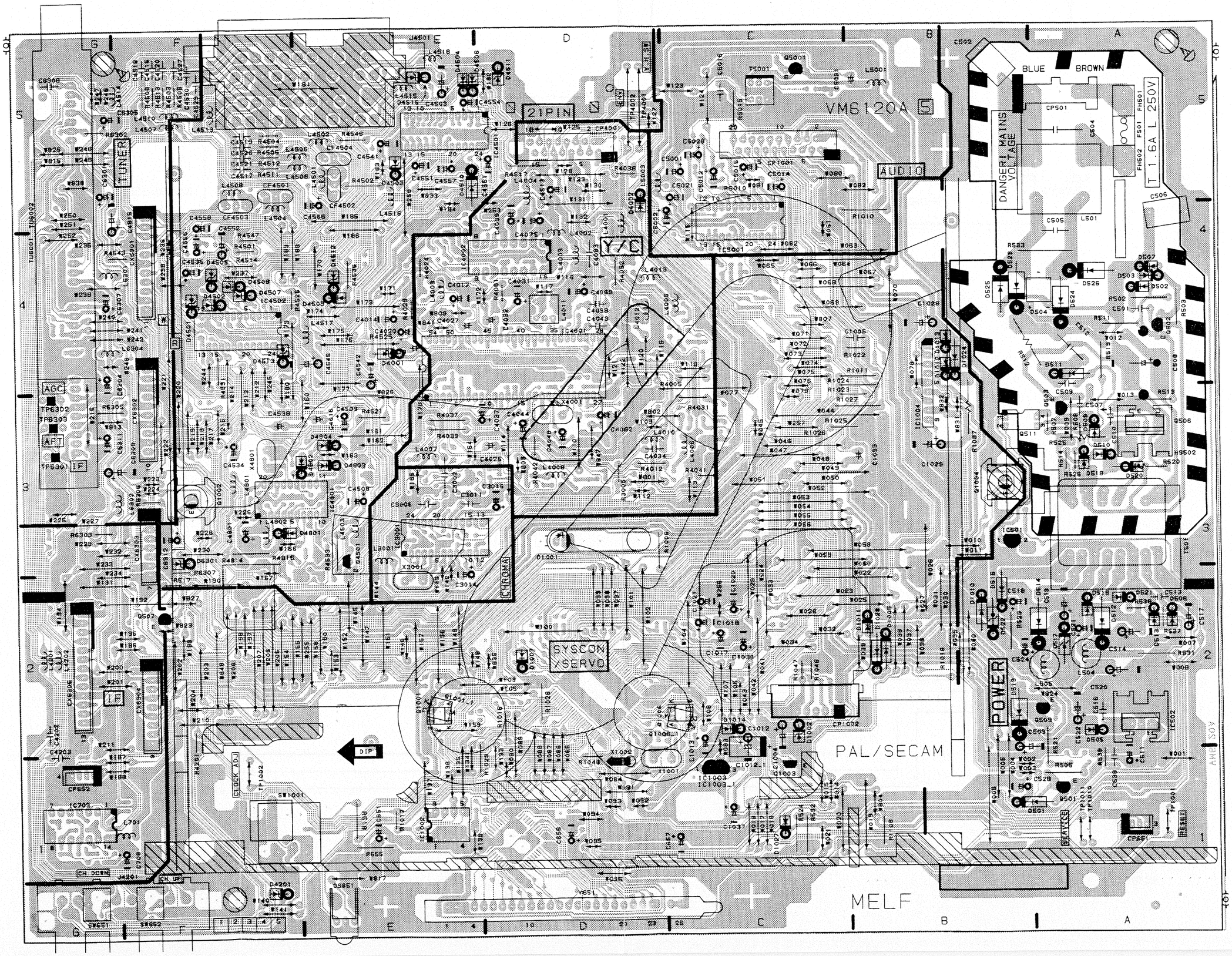
OPERATION BLOCK DIAGRAM



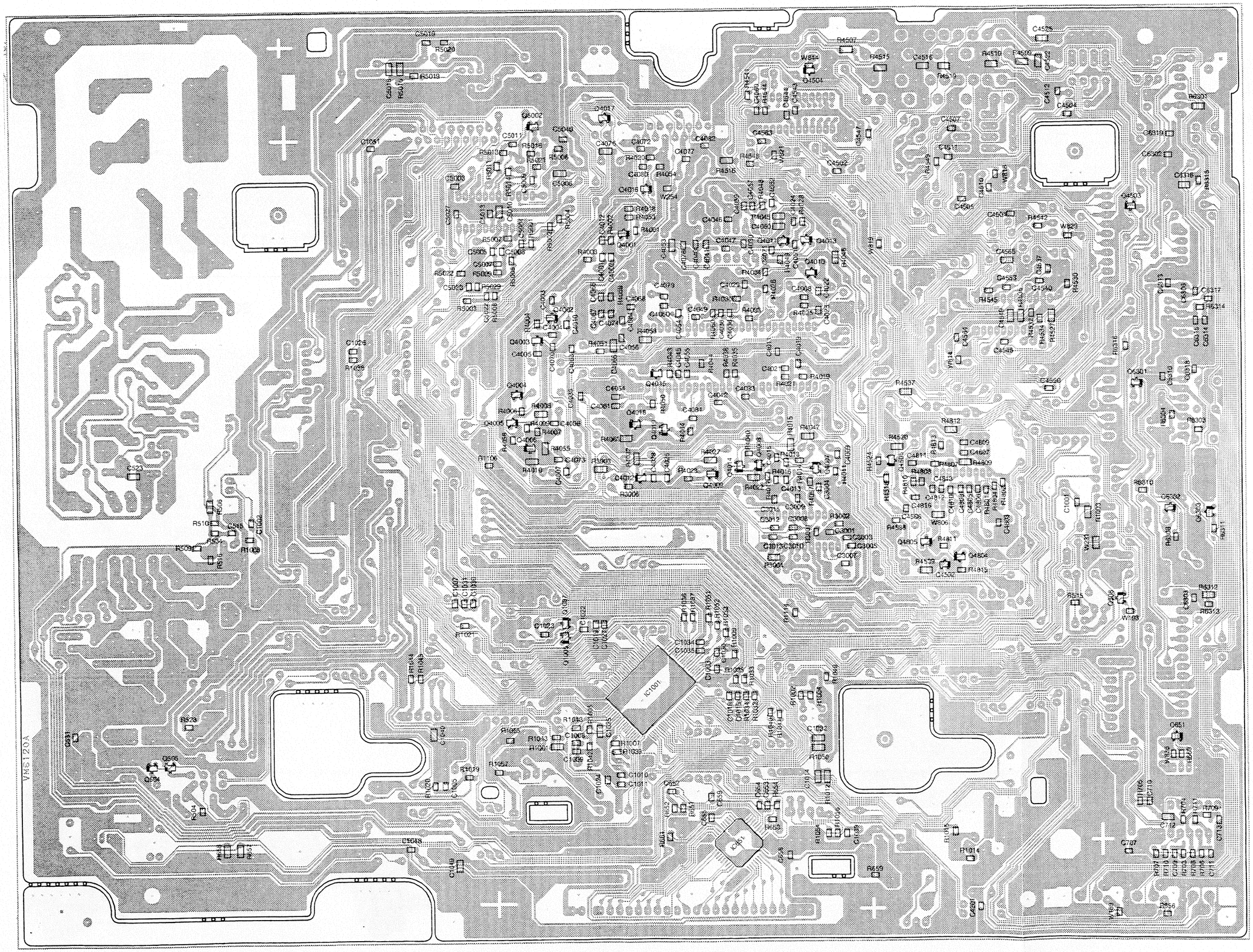
POWER BLOCK DIAGRAM



PRINTED CIRCUIT BOARDS
MAIN
COMPONENT SIDE



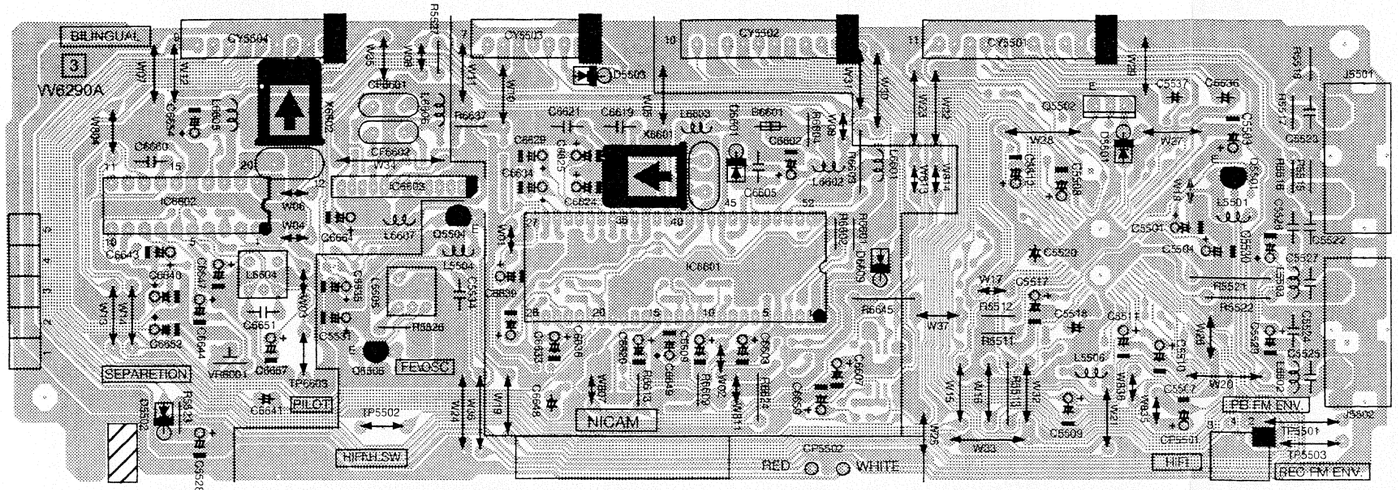
PRINTED CIRCUIT BOARDS
MAIN
SOLDER SIDE



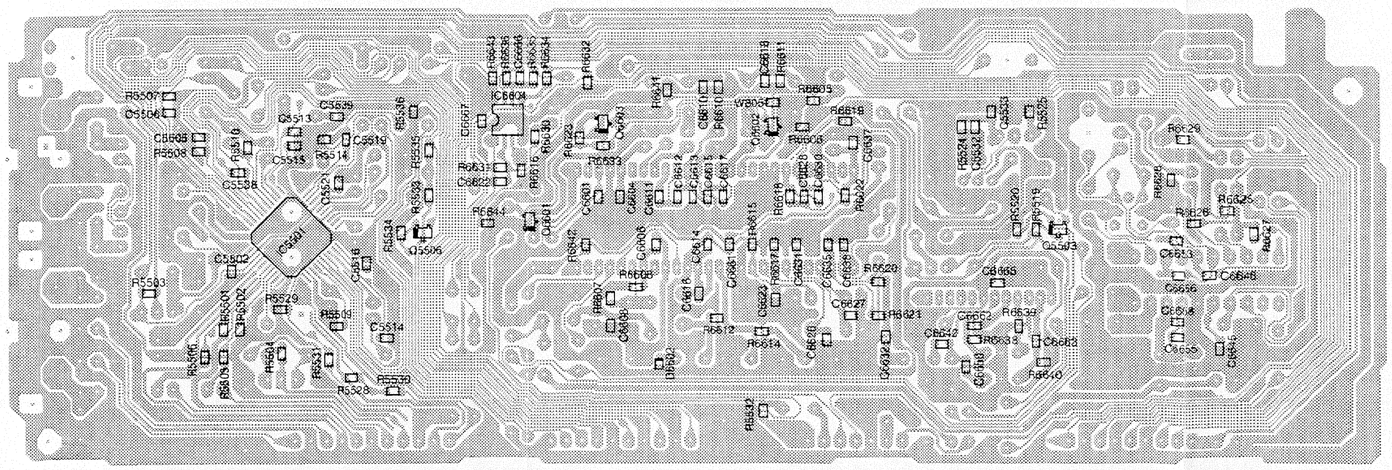
PRINTED CIRCUIT BOARDS

HI-FI

COMPONENT SIDE

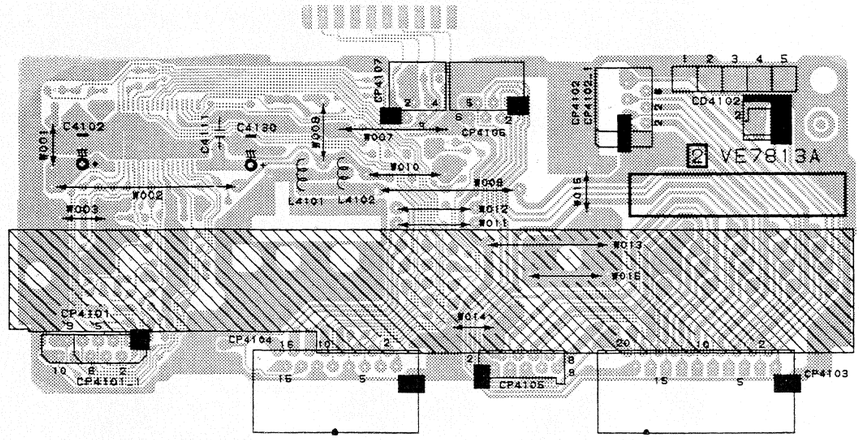


SOLDER SIDE

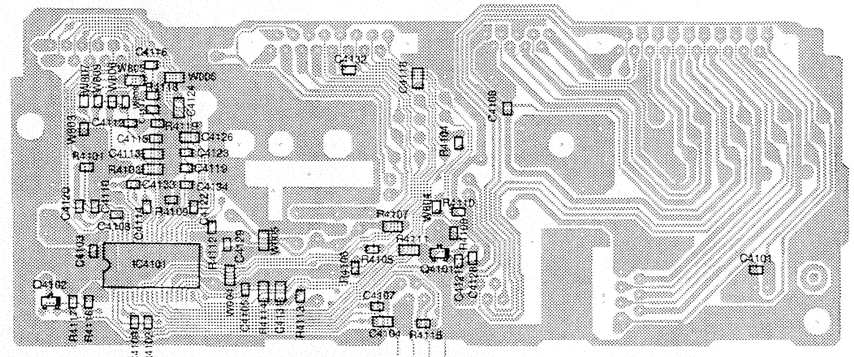


HEAD AMP

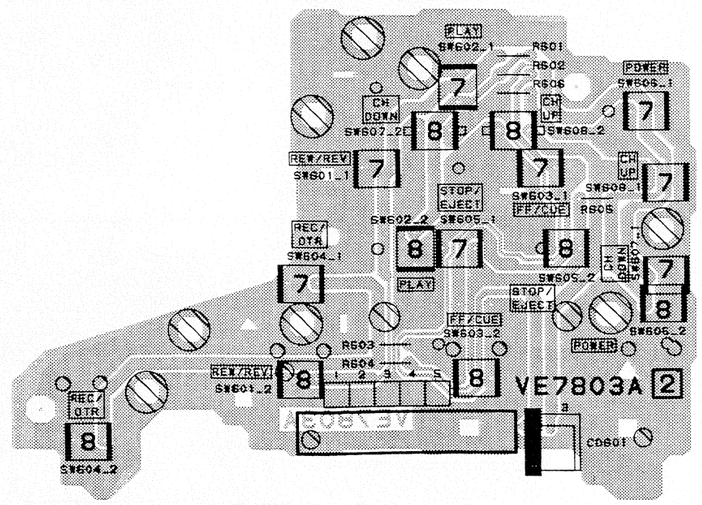
COMPONENT SIDE



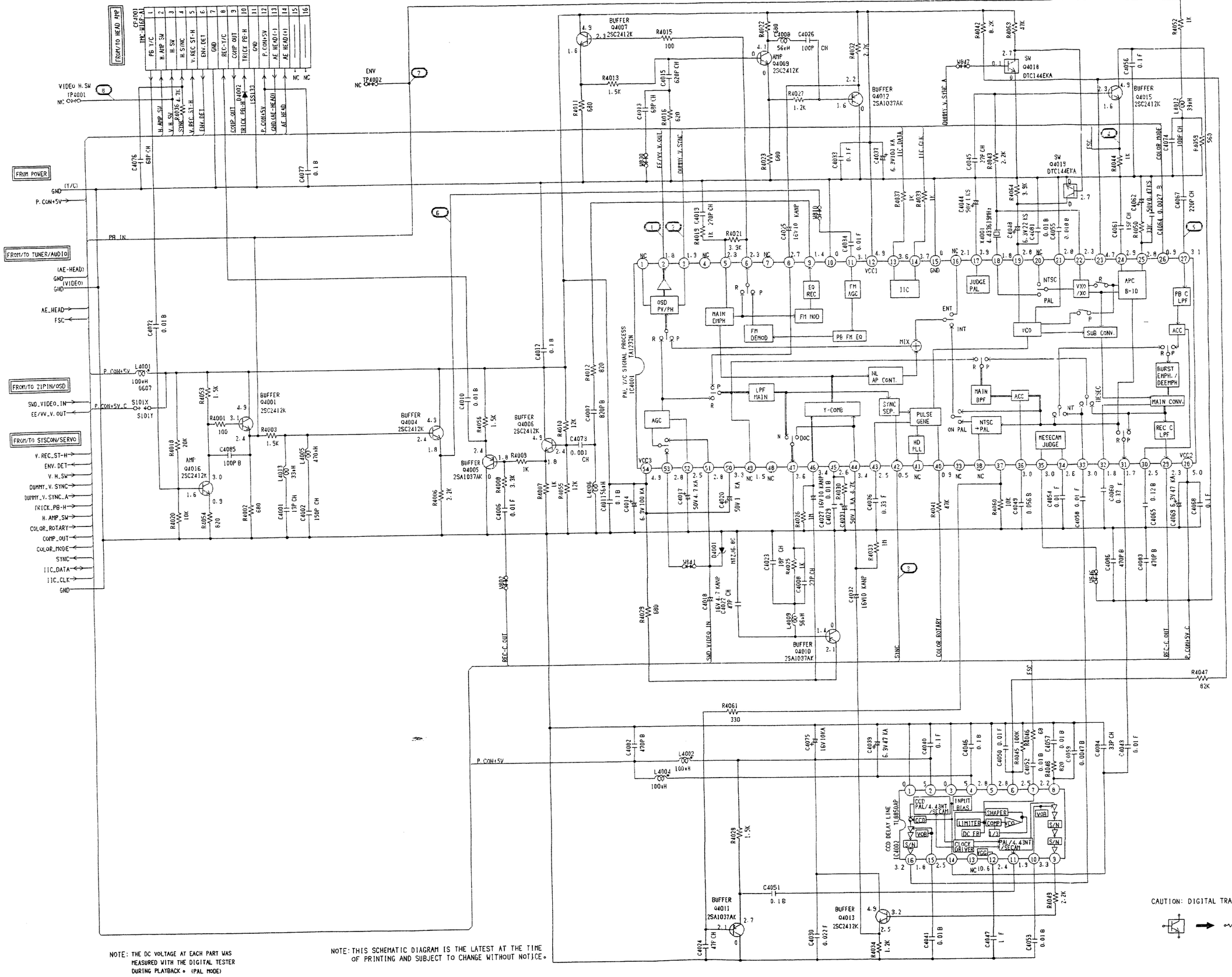
SOLDER SIDE



OPERATION



Y/C SCHEMATIC DIAGRAM



NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK ◦ (PAL MODE)

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE◦

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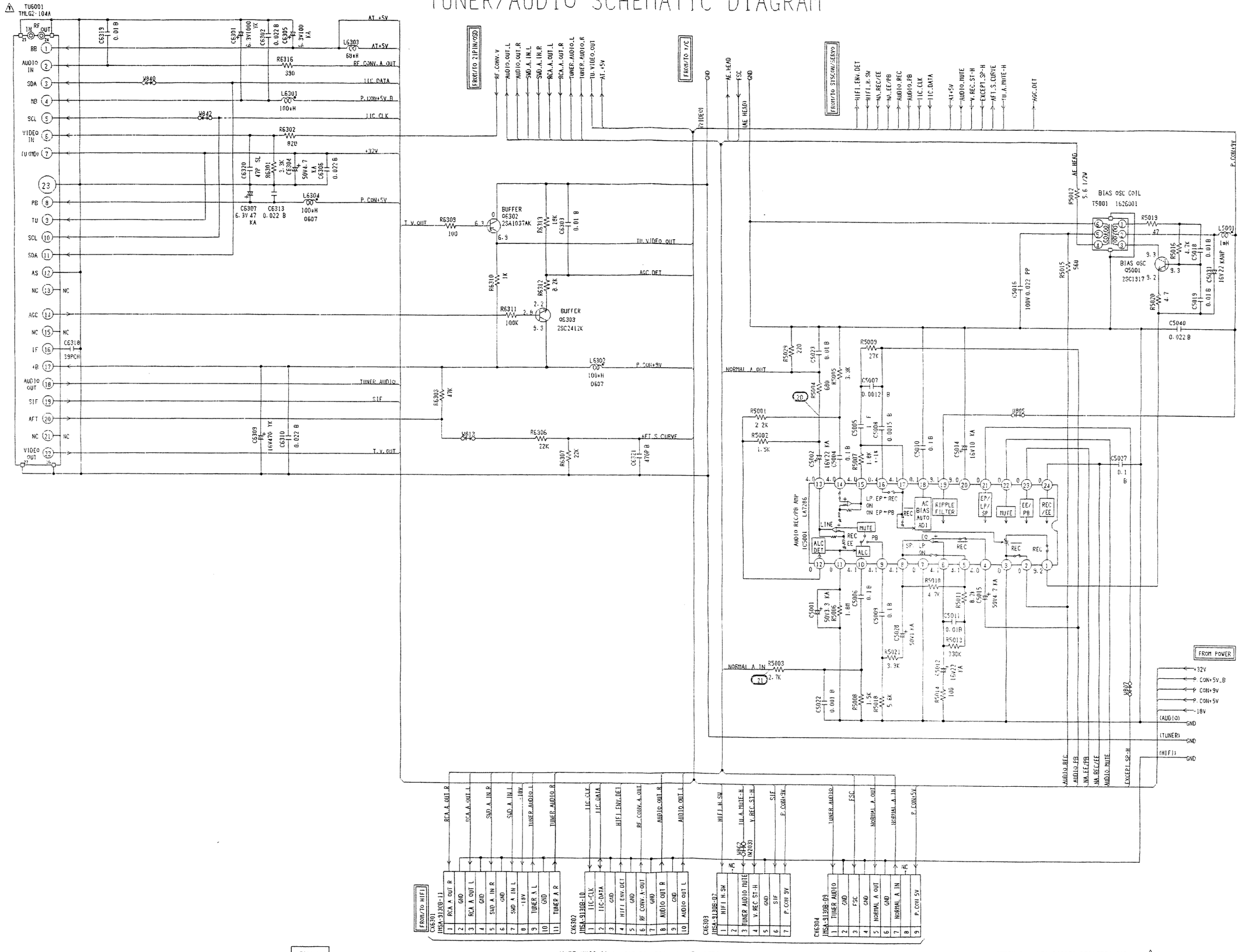
TUNER/AUDIO SCHEMATIC DIAGRAM



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NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

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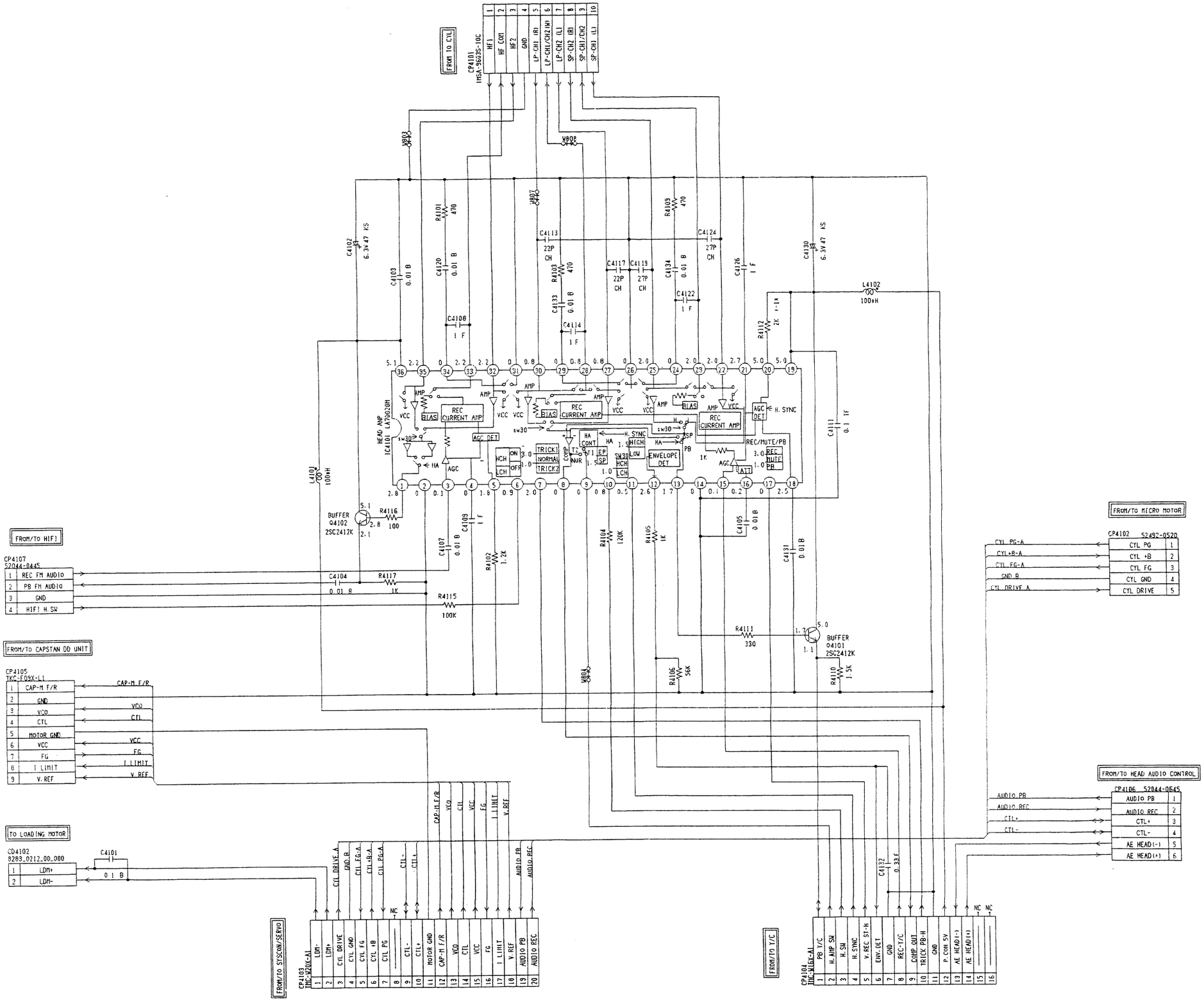
CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY. USE ONES DESCRIBED IN PARTS LIST ONLY.

ATTENTION: LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN PONT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES.

HEAD AMP SCHEMATIC DIAGRAM



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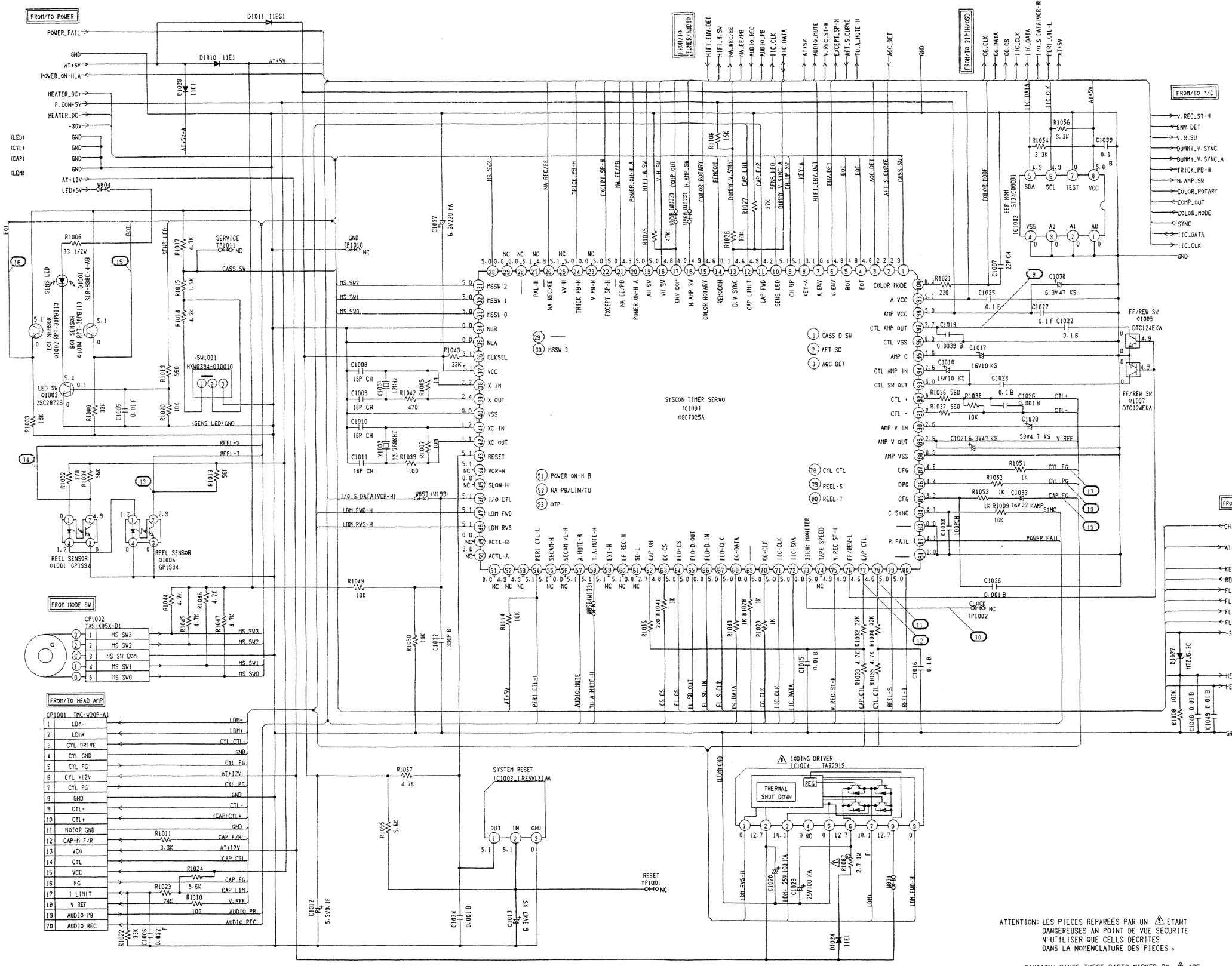
SYSTEM CONTROL/SERVO SCHEMATIC DIAGRAM



NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

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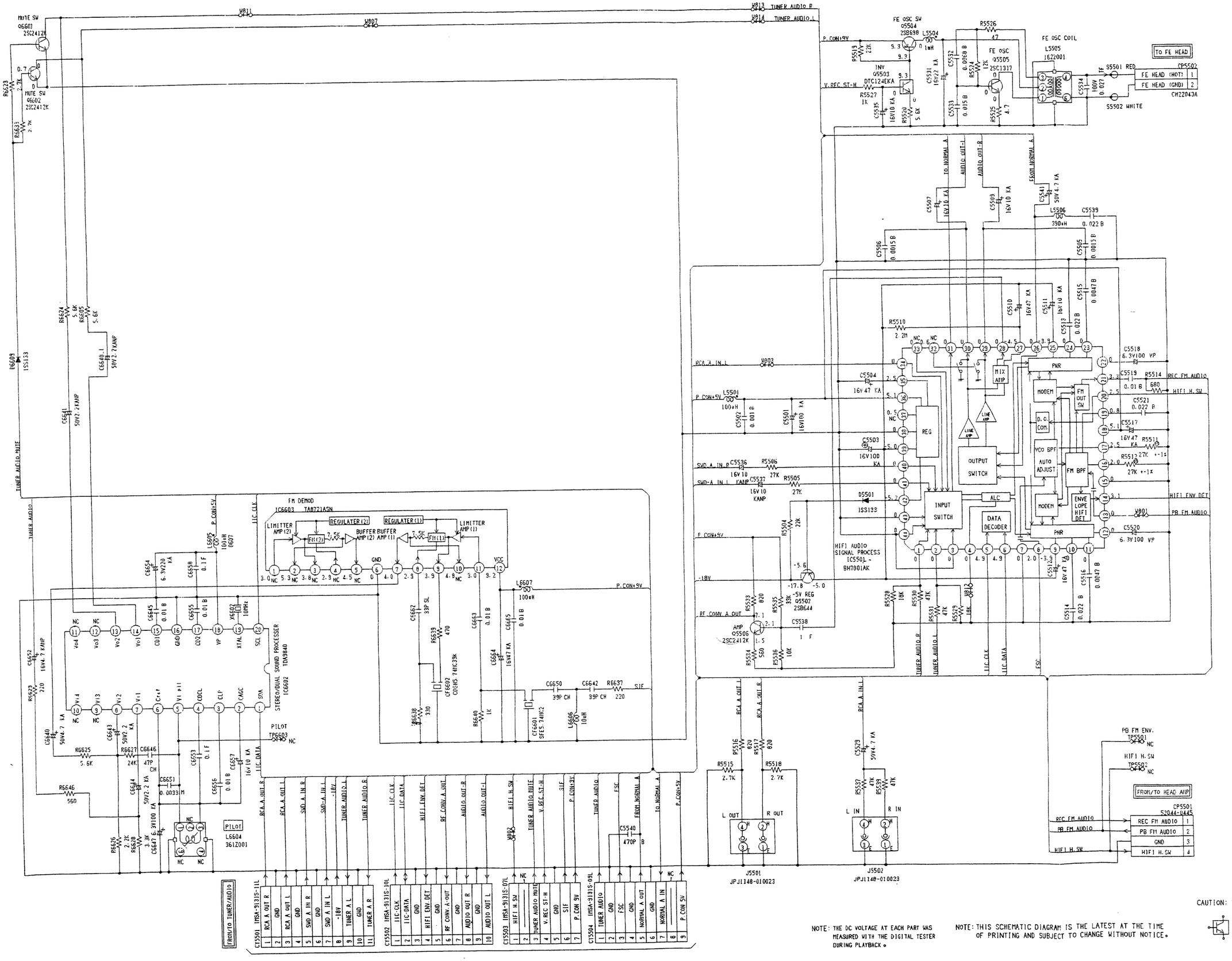
CAUTION: DIGITAL TRANSISTOR

3-6261

HI-FI SCHEMATIC DIAGRAM

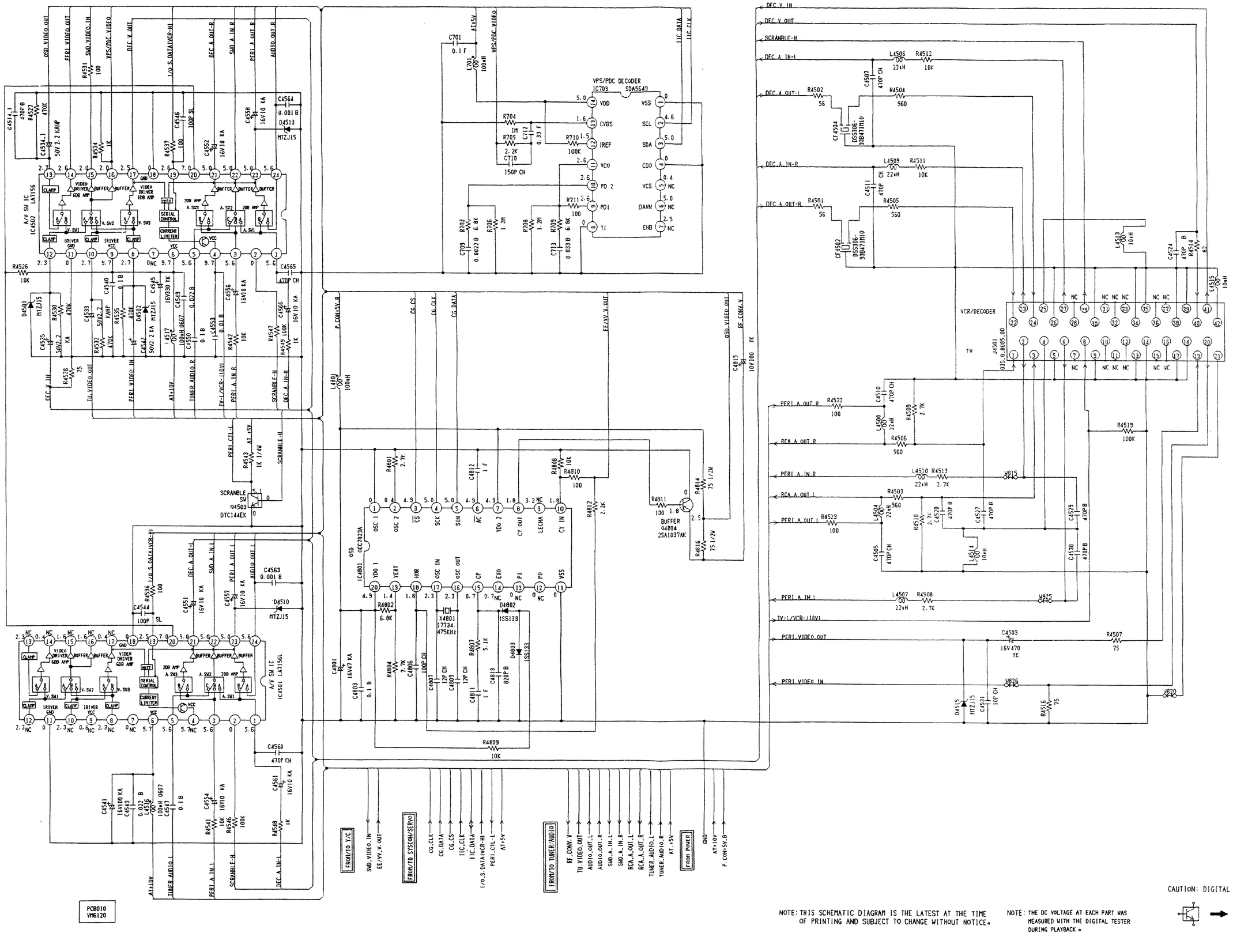


NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

CAUTION: DIGITAL TRANSISTOR

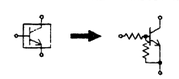
21PIN/OSD SCHEMATIC DIAGRAM



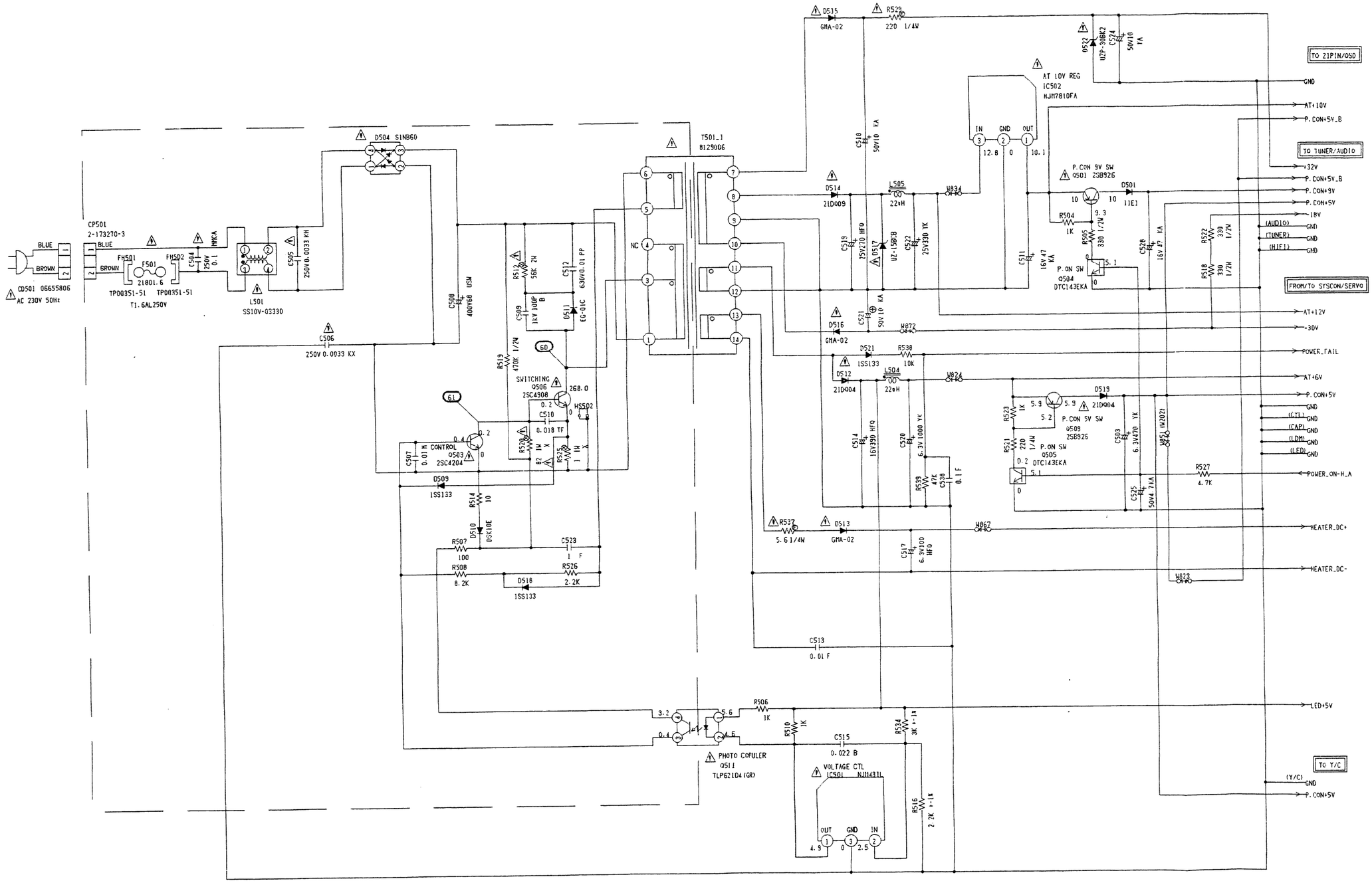
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

CAUTION: DIGITAL TRANSISTOR



POWER SCHEMATIC DIAGRAM



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NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

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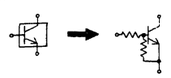
CAUTION: DIGITAL TRANSISTOR



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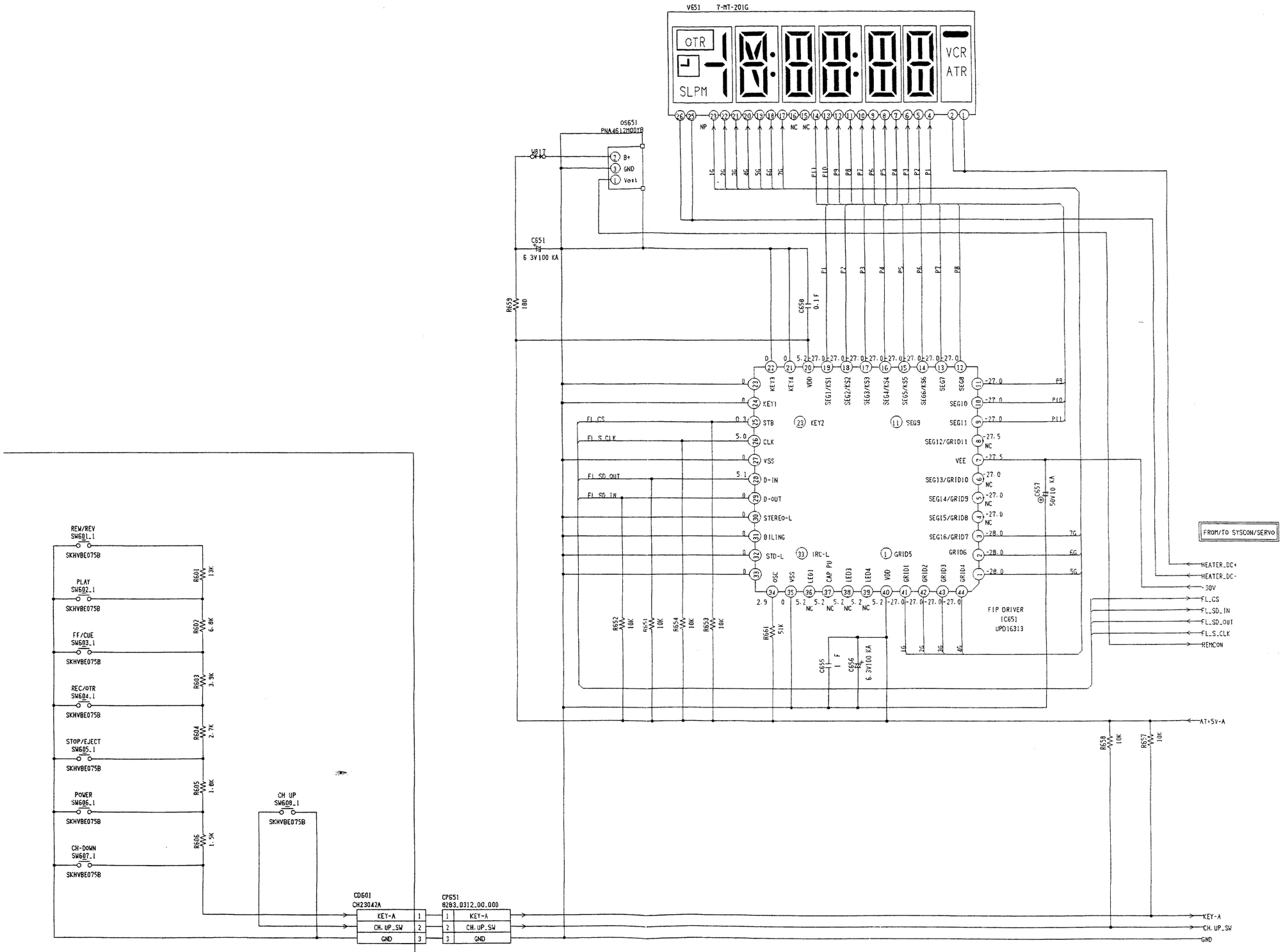
OPERATION SCHEMATIC DIAGRAM



NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

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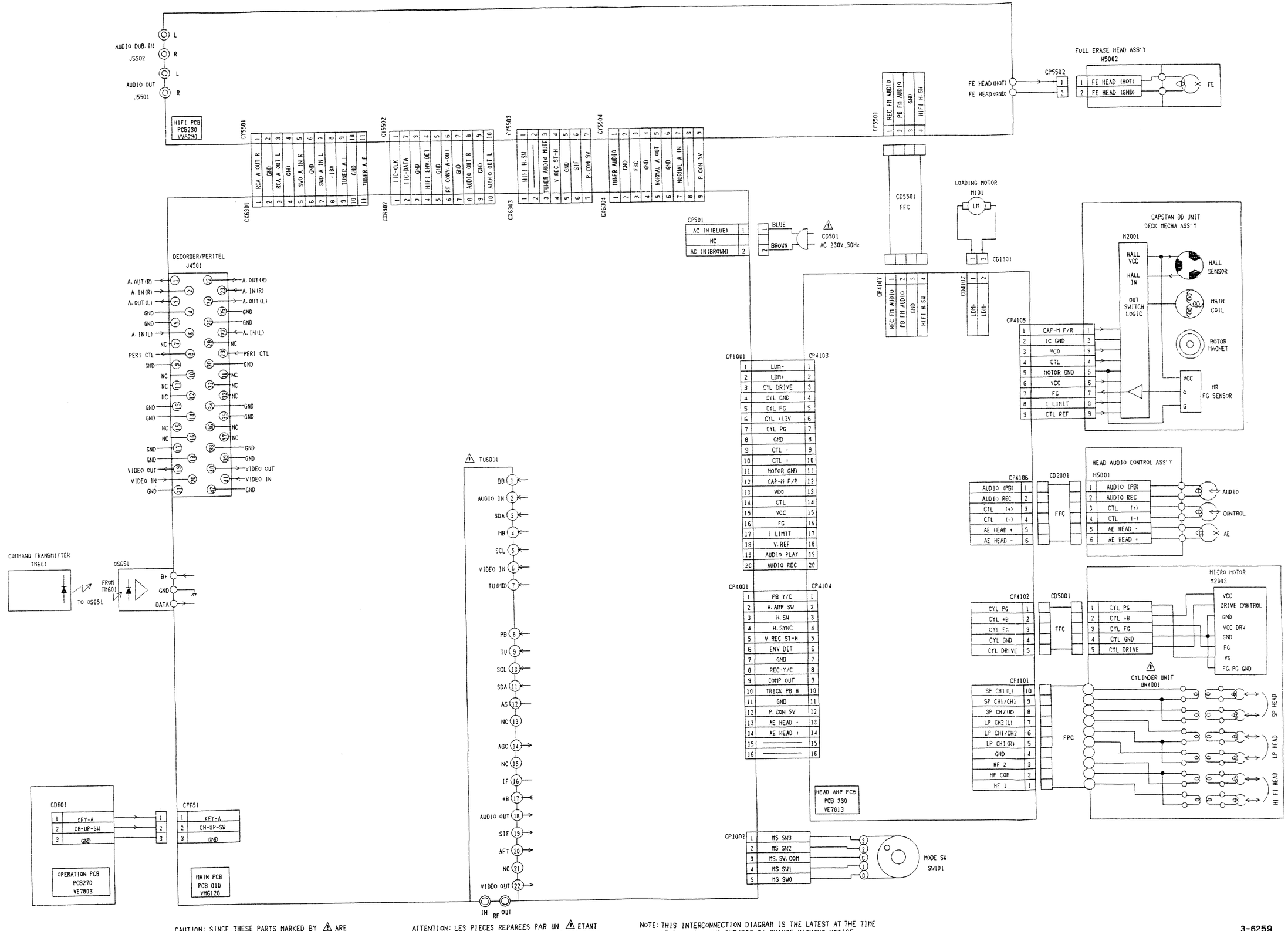
INTERCONNECTION DIAGRAM

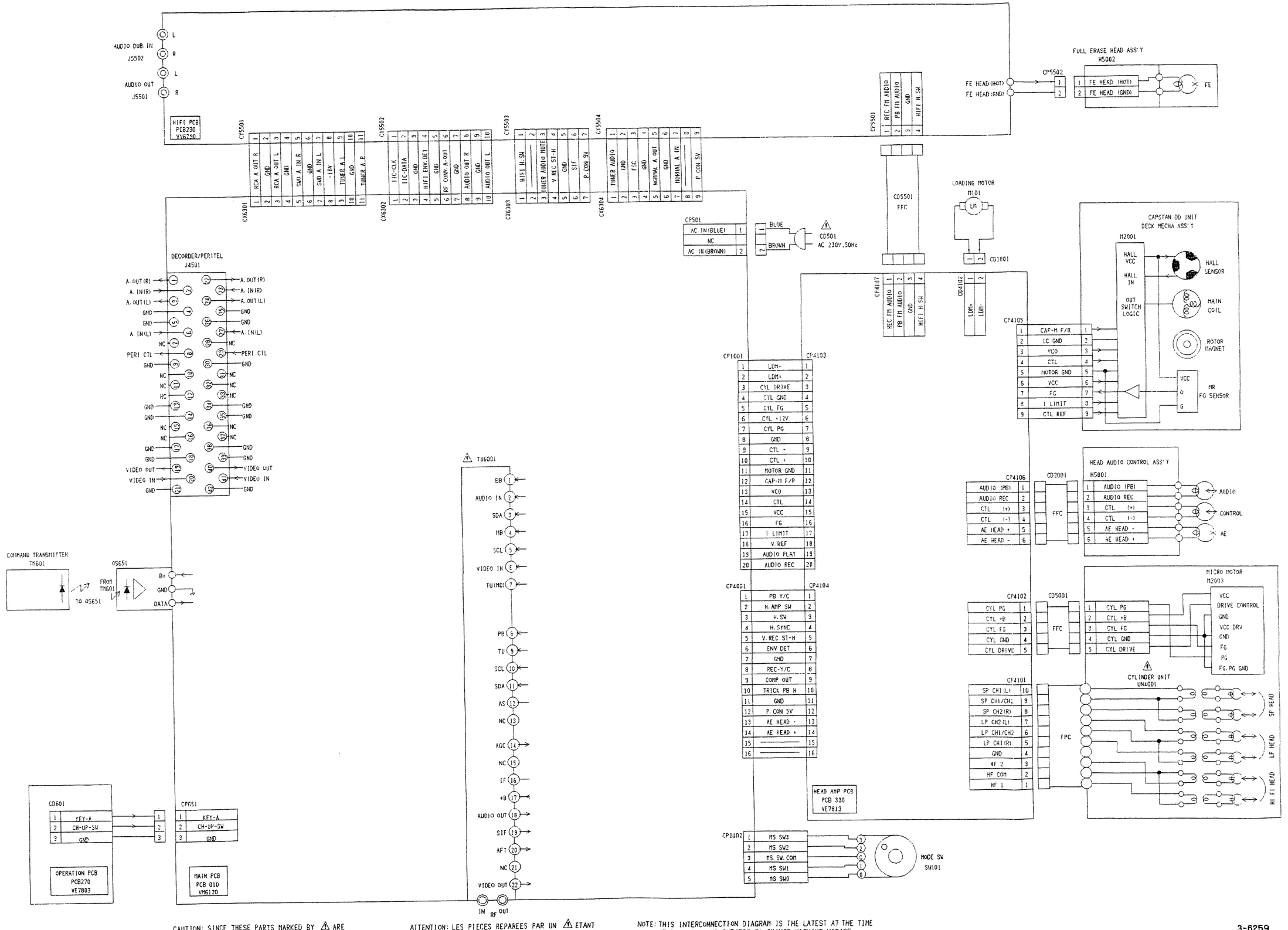


CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY. USE ONES DESCRIBED IN PARTS LIST ONLY.

ATTENTION: LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES.

NOTE: THIS INTERCONNECTION DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

INTERCONNECTION DIAGRAM



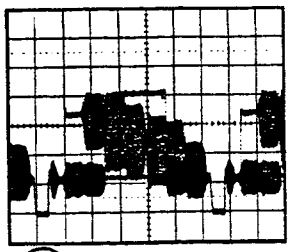
CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY. USE ONES DESCRIBED IN PARTS LIST ONLY.

ATTENTION: LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES.

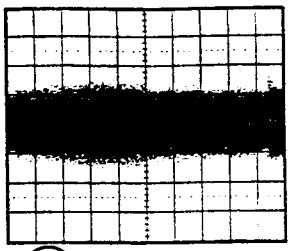
NOTE: THIS INTERCONNECTION DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

WAVEFORMS

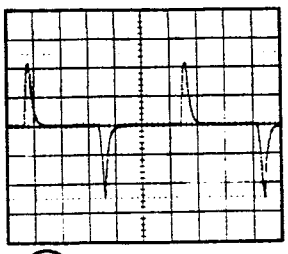
Y/C



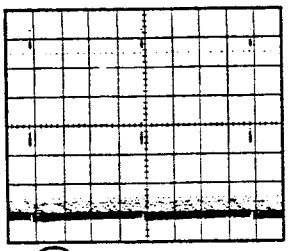
(1) 0.5V 10µs/div



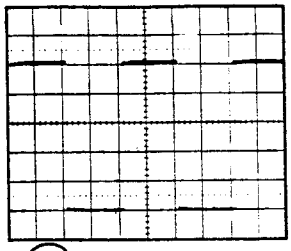
(7) 200mV 2ms/div



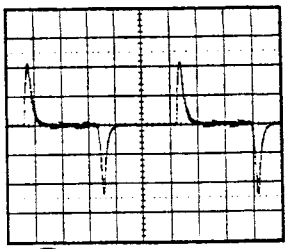
(13) 1V 0.2s/div



(2) 0.5V 5ms/div

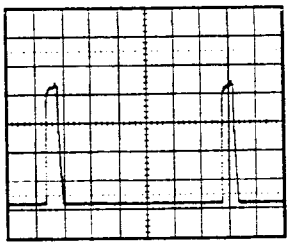


(8) 1V 10ms/div

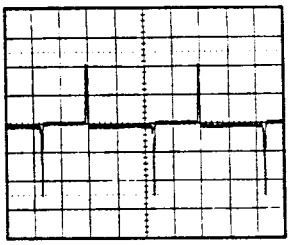


(14) 1V 0.2s/div

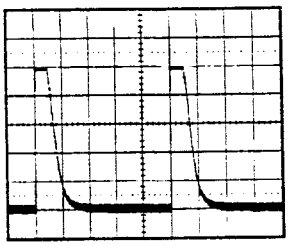
SYSCON/SERVO



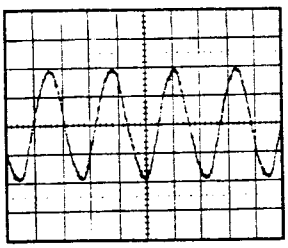
(3) 1V 10µs/div



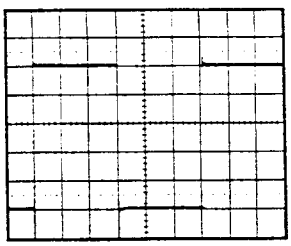
(9) 1V 10ms/div



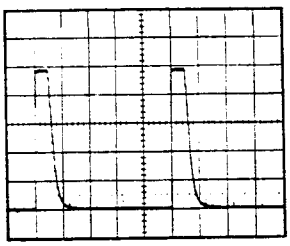
(15) 1V 2ms/div



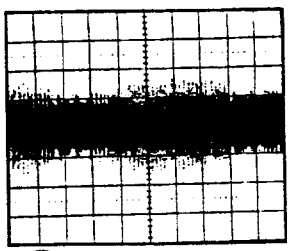
(4) 100mV 0.1µs/div



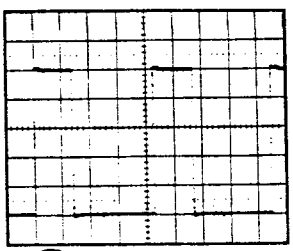
(10) 1V 10µs/div



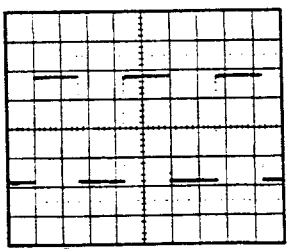
(16) 1V 2ms/div



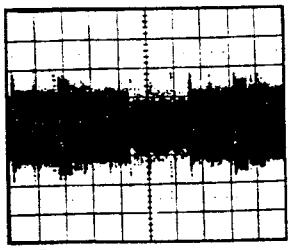
(5) 50mV 10µs/div



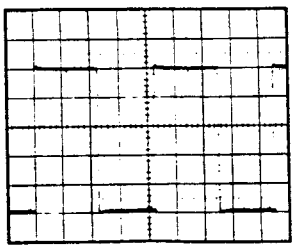
(11) 1V 5µs/div



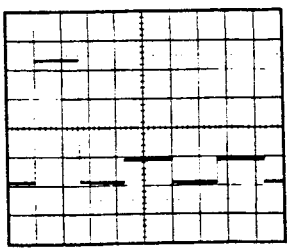
(17) 1V 0.5ms/div



(6) 100mV 10µs/div



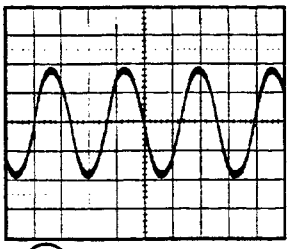
(12) 1V 5µs/div



(18) 1V 0.5ms/div

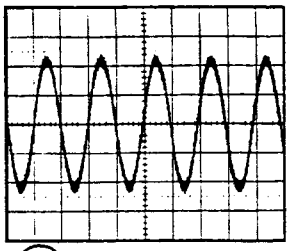
The following waveforms were measured at the point of the corresponding balloon number in the schematic diagram.

WAVEFORMS

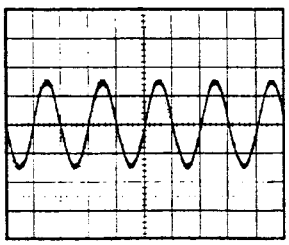


(19) 0.5V 0.5ms/div

TUNER/AUDIO

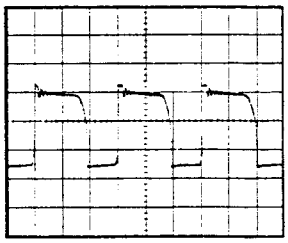


(20) 200mV 0.5ms/div

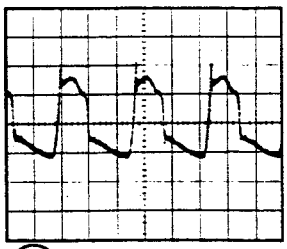


(21) 100mV 0.5ms/div

POWER



(60) 200V 5μs/div

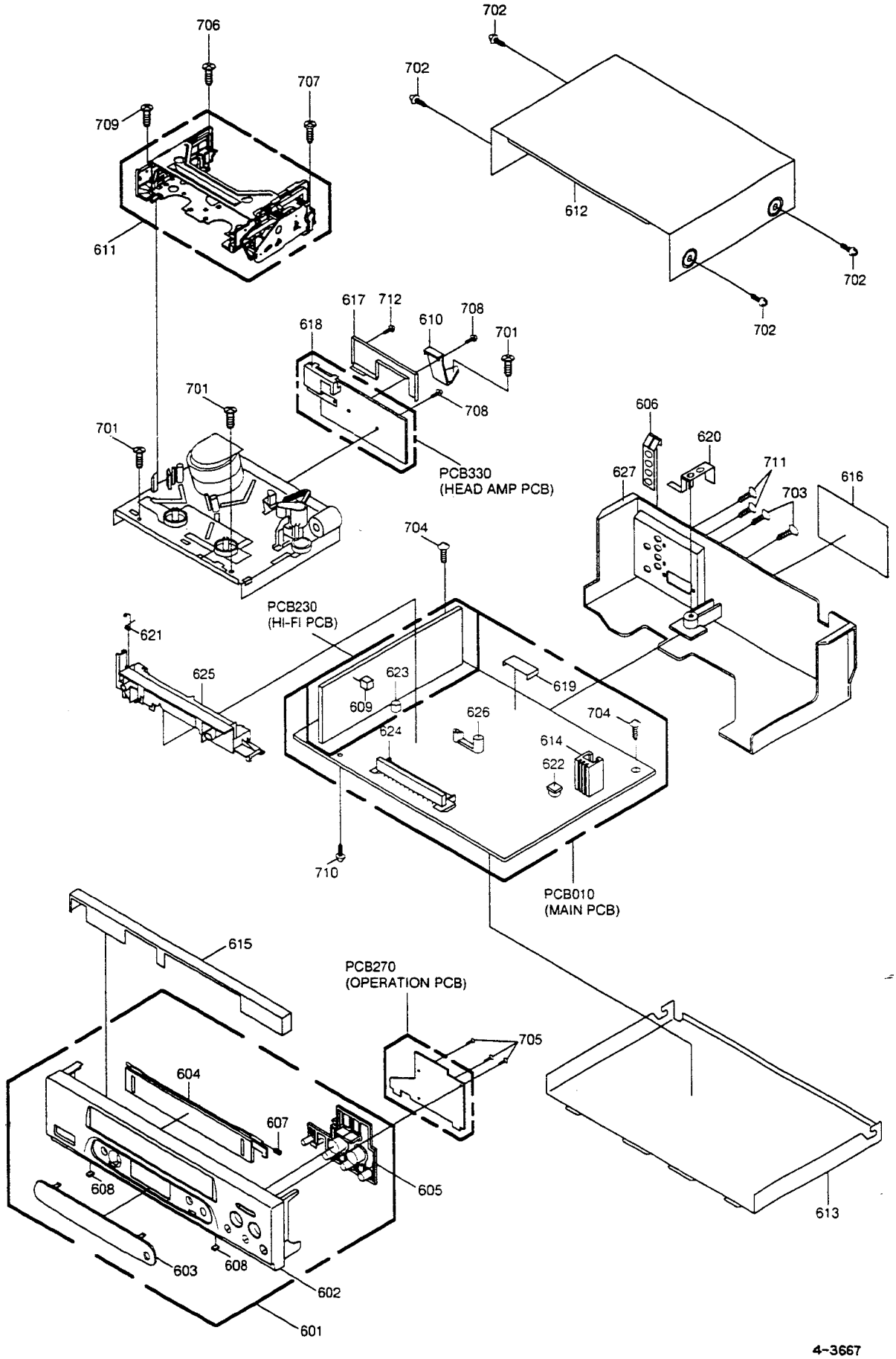


(61) 0.5V 5μs/div

The following waveforms were measured at the point of the corresponding balloon number in the schematic diagram.

4-3580

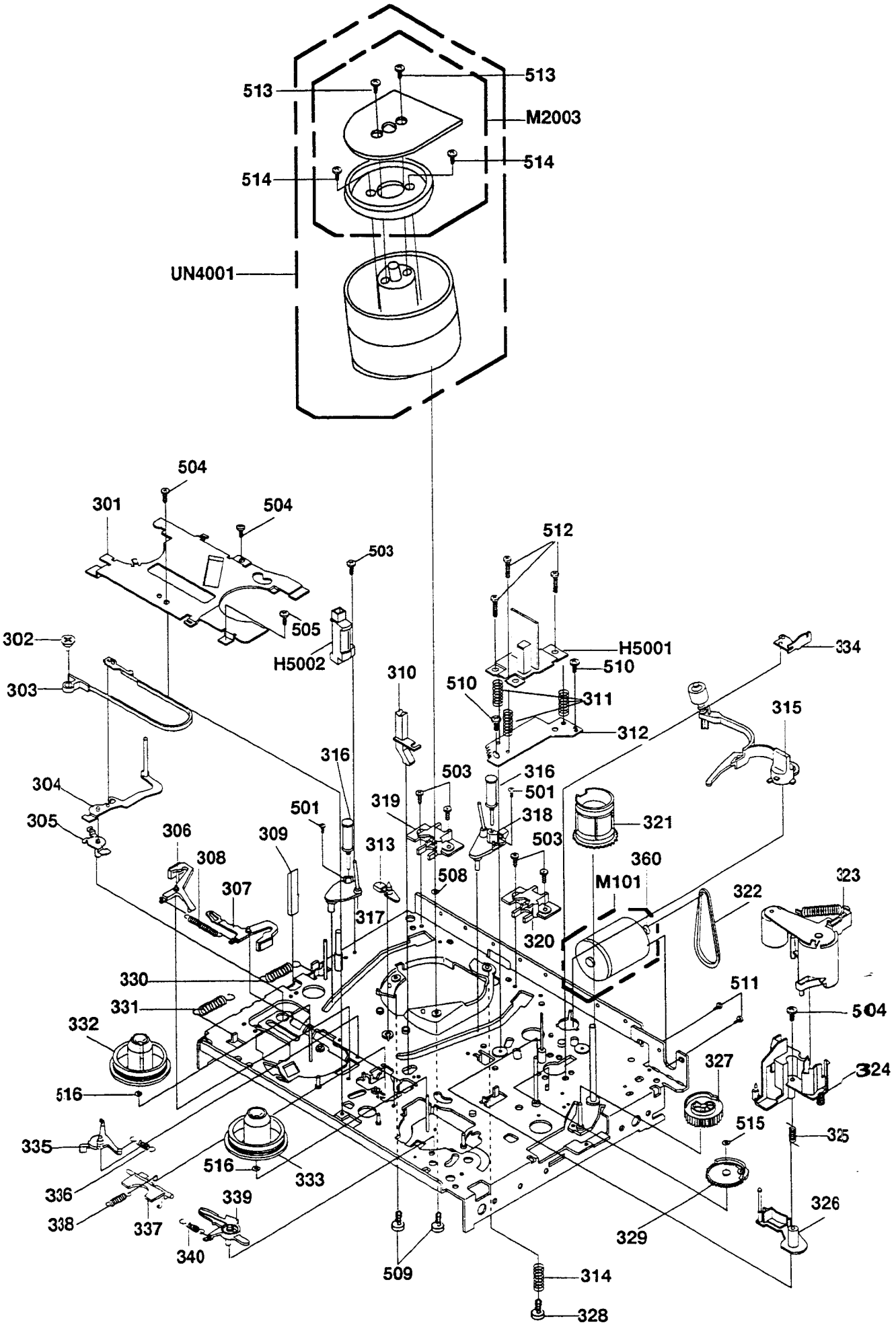
MECHANICAL EXPLODED VIEW



MECHANICAL REPLACEMENT PARTS LIST

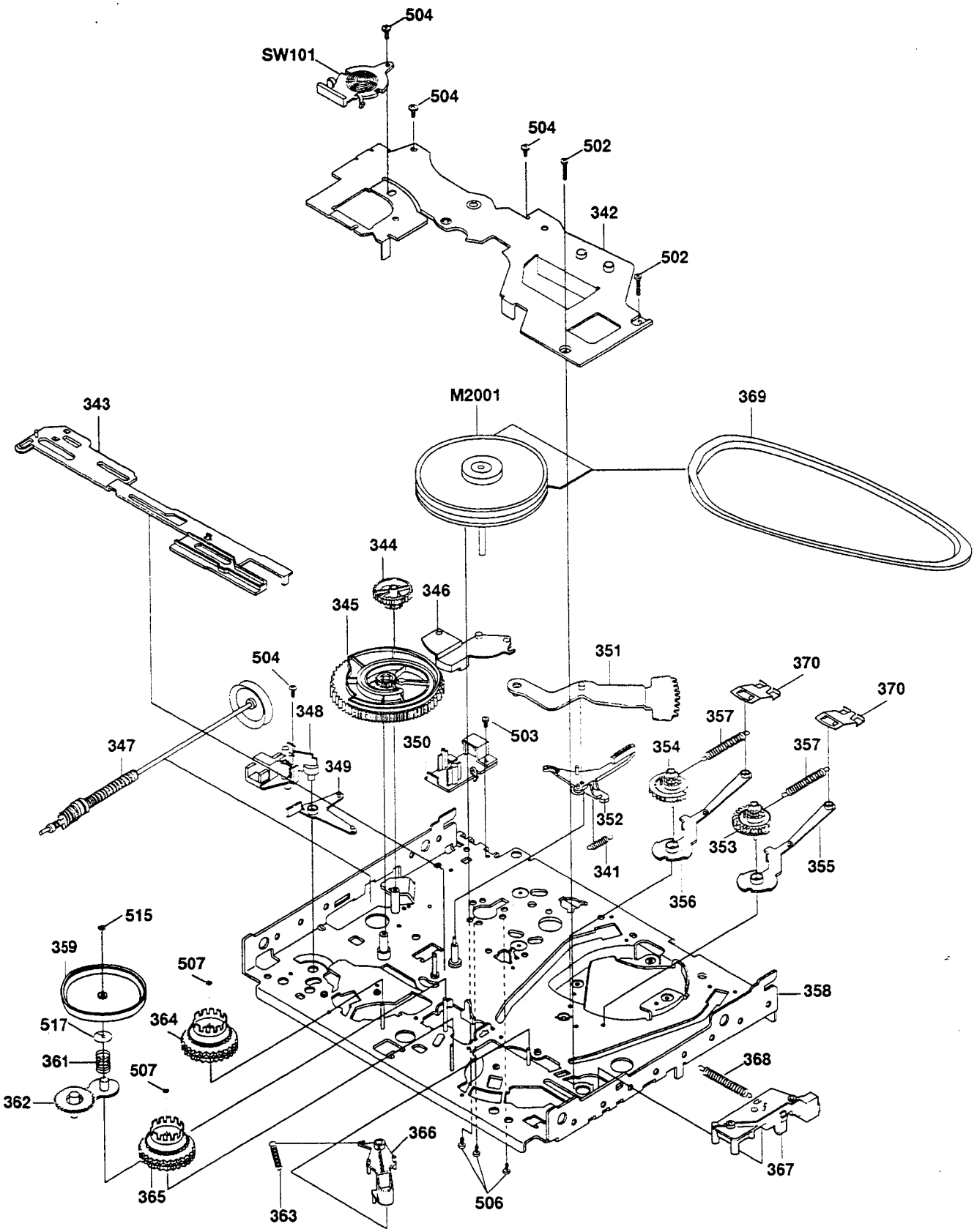
REF.NO.	PART NO.	DESCRIPTION
601	A4C015B720	CABINET,FRONT ASS'Y
602	701WPJA183	CABINET,FRONT
603	711WPDA050	PLATE,DISPLAY
604	712WPJA109	FLAP
605	735WPAA041	BUTTON,DECK
606	753WUA0049	SPRING,EARTH 4PIN
607	743WKAA001	SPRING,FLAP
608	800WFA0001	CUSHION,LEG
609	800WF00015	CUSHION (10*10*T9)
610	762WSA0028	ANGLE,DECK BACK
611	850A900163	UNIT ASS'Y
612	702USS0023	CABINET,TOP
613	702WSA0033	PLATE,BOTTOM
614	----	HEAT SINK
615	761WSAA002	ANGLE,DECK
616	722202A130	SHEET,RATING
617	753WSA0095	SHIELD,CASE HEAD AMP
618	753WSA0106	SHIELD,COVER HEAD AMP
619	753WSA0098	PLATE,EARTH SYSCON
620	753WSA0099	PLATE,EARTH BOTTOM
621	743WKAA003	SPRING,FL EARTH
622	754WPA0015	COVER,LED(R)
623	754WPA0014	COVER,LED(L)
624	756WPAA003	HOLDER,CLOCK
625	761WPAA004	HOLDER,DECK
626	850PT00031	HOLDER,LED
627	702WPA0382	PANEL,BACK
701	8117140A24	SCREW,TAPPING(BO) PAN 4*12
702	8117540A02	SCREW,TAPPING(BO) TRUSS 4*10
703	8117426A02	SCREW,TAPPING(BO) OVAL 2.6*10
704	8107230604	SCREW,TAP TITE(S) BIND 3*6
705	8110226084	SCREW,TAP TITE(P) BIND 2.6*8
706	8107226604	SCREW,TAP TITE(S) BIND 2.6*6
707	8107126805	SCREW,TAP TITE(S) PAN 2.6*8
708	8107230804	SCREW,TAP TITE(S) BIND 3*8
709	8110630A04	SCREW,TAP TITE(P) BRAZIER 3*10
710	8110630804	SCREW,TAP TITE(P) BRAZIER 3*8
711	8110230A02	SCREW,TAP TITE(P) BIND 3*10
712	810A130604	SCREW/WASHER(A) M3*6
---	JB5X0300	POLYBAG
---	J3A20702	GUARANTEE CARD
---	J4C01501	INSTRUCTION BOOK
---	J4C01507	QUICK SET UP SHEET
---	791UHA0005	GIFT SHEET
---	792UHA0083	PACKAGE
---	793UCDA112	GIFT BOX

CHASSIS EXPLODED VIEW (TOP VIEW)



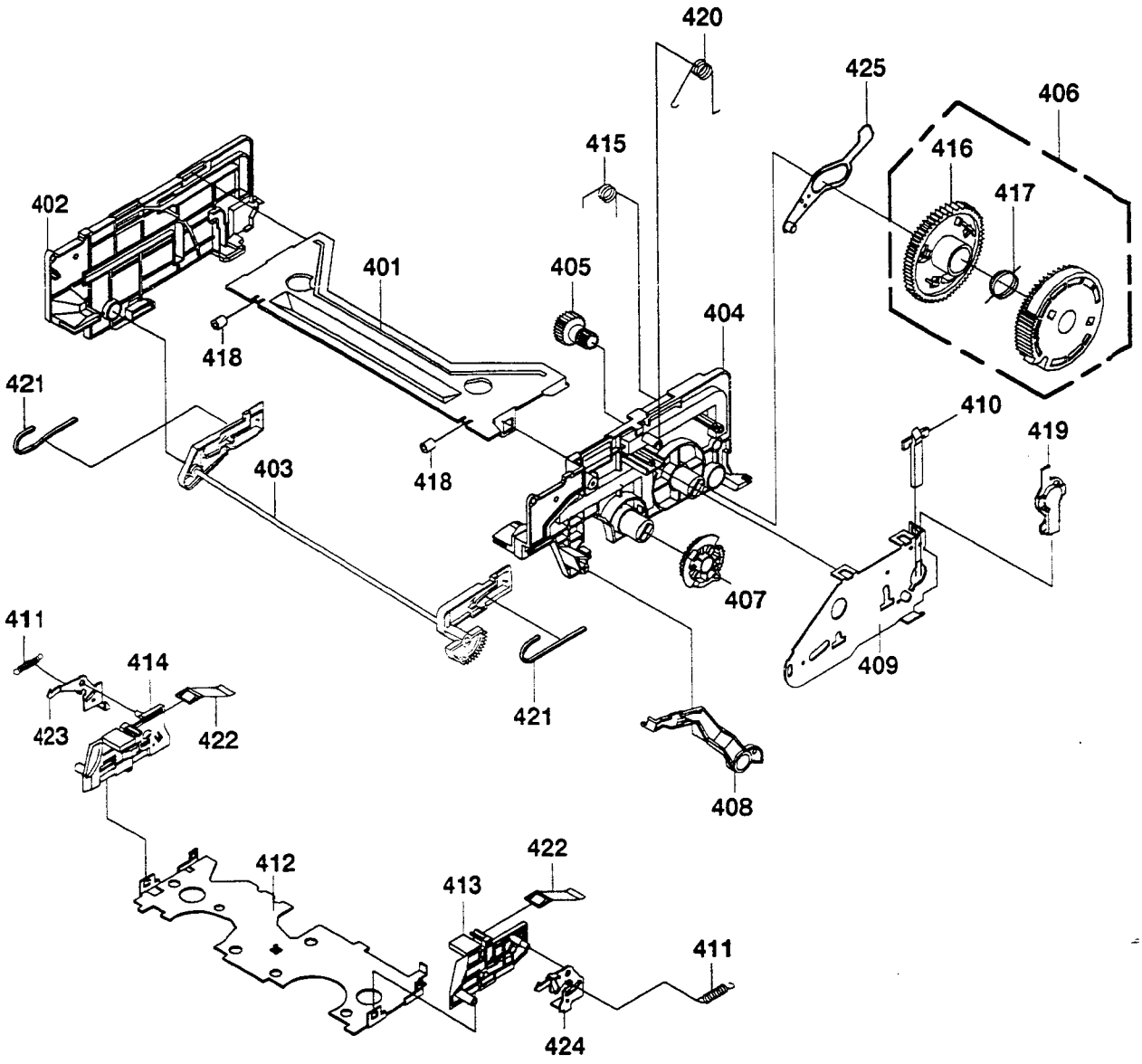
4-3400

CHASSIS EXPLODED VIEW (BOTTOM VIEW)



4-3401

UNIT ASS'Y EXPLODED VIEW



CHASSIS/UNIT ASS'Y REPLACEMENT PARTS LIST

REF.NO.	PART NO.	DESCRIPTION
301	850P600471	BRACKET,BRAKE
302	850P400358	ADJUST,TENSION
303	850A400122	TENSION BAND ASS'Y
304	850A400124	TENSION ARM ASS'Y
305	850A400123	TENSION LEVER 2 ASS'Y
306	850A600155	MAIN BRAKE S ASS'Y
307	850A600156	MAIN BRAKE T ASS'Y
308	850P800252	SPRING,MAIN BRAKE
309	850P900564	REFLECTOR,EOT
310	850P400411	REFLECTOR,LED 2
311	850P800269	SPRING,AC HEAD
312	850P500060	BASE,AC HEAD
313	850P000394	POST,CASS GUIDE L
314	850P800245	SPRING,AZIMUTH 2
315	850A500013	AHC ASS'Y
316	850A400102	GUIDE ROLLER ASS'Y
317	850A400114	BASE,S INCLINED ASS'Y
318	850A400115	BASE,T INCLINED ASS'Y
319	850P400330	CATCHER S
320	850P400332	CATCHER T
321	850P400343	CAM,PINCH ROLLER
322	850P600487	BELT,LOADING
323	850A400117	PINCH ROLLER BLOCK
324	850P900541	CASS OPENER
325	850P800264	SPRING,P5
326	850A400120	P5 ARM ASS'Y
327	850P400342	CAM,GEAR
328	8146230A14	JOINT SCREW BIND M3*11
329	850P400344	CAM,P5
330	850P400356	SPRING,TENSION ARM 2
331	850P400357	SPRING,TENSION ARM 1
332	850P200216	REEL S
333	850P200217	REEL T
334	850P400402	CATCHER,P5 2
335	850P600465	SUB BRAKE S
336	850P800253	SPRING,S-S BRAKE
337	850P200247	ARM,JOINT
338	850P800262	SPRING,JOINT ARM
339	850A600157	SUB BRAKE T ASS'Y
340	850P800254	SPRING,T-S BRAKE
341	850P800255	SPRING,CAP BRAKE
342	850P600485	PLATE,BOTTOM
343	850A600176	ROD MAIN ASS'Y
344	850P400341	GEAR,MIDDLE
345	850P600472	CAM,MAIN
346	850P600468	LEVER,MAIN BRAKE
347	850A600159	WORM ASS'Y
348	850P600483	BRACKET,WORM F
349	850P600474	LEVER,RATCHET
350	850P600484	BRACKET,WORM R
351	850P300151	LEVER,LOADING
352	850A600158	CAP BRAKE ASS'Y (S)
353	850P300152	GEAR,LOADING S
354	850P300153	GEAR,LOADING T
355	850A300053	LOADING ARM S ASS'Y
356	850A300054	LOADING ARM T ASS'Y
357	850P800263	SPRING,LOADING GEAR
358	850A000222	MAIN CHASSIS ASS'Y
359	850P200213	CENTER PULLEY
360	850P600486	PULLEY,LDM 5
361	850P800261	SPRING,C-PULLEY
362	850A200065	ARM IDLER ASS'Y
363	850P800270	SPRING,LEVER TENSION
364	850A200064	CLUTCH GEAR T ASS'Y
365	850A200063	CLUTCH GEAR S ASS'Y
366	850P400360	LEVER,TENSION
367	850P400359	HOLDER,TENSION
368	850P800256	SPRING,MAIN ROD
369	850P200215	BELT,CAPSTAN
370	850P300150	SLIDER,LOADING

REF.NO.	PART NO.	DESCRIPTION
401	850P900617	BRACKET,TOP
402	850P900673	BRACKET,SIDE L
403	850A900165	LINK ASSY
404	850P900615	BRACKET,SIDE R
405	850P900601	GEAR,JOINT
406	850P900602	GEAR,CAM
407	850P900609	GEAR,LINK R
408	850P900618	LEVER,FLAP 2
409	850P900616	BRACKET,SIDE R2
410	850P900621	REFLECTOR,BOT
411	850P800296	SPRING,LOCKER
412	850P900611	CASS HOLDER
413	850P900613	CASS,SIDE R
414	850P900612	CASS,SIDE L
415	850P800298	SPRING,BRACKET R
416	850P900608	GEAR,CLUTCH
417	850P800297	SPRING,CLUTCH
418	850P98A001	RUBBER,SILICON
419	850P900620	COVER,SENSOR BOT
420	850P800290	SPRING,EARTH
421	850P800294	SPRING,LINK
422	850P800299	SPRING,PACK
423	850P900605	LOCKER,L
424	850P900606	LOCKER,R
425	850P900610	LEVER,BOT
501	8110217401	SCREW TAP TITE(P) BIND 1.7*4.0
502	8109226A64	SCREW,TAP TITE(B) BIND 2.6*16
503	8107226804	SCREW,TAP TITE(S) BIND 2.6*8
504	8107226604	SCREW,TAP TITE(S) BIND 2.6*6
505	8107123604	SCREW,TAP TITE(S) PAN 2.3*6
506	8109126804	SCREW,TAP TITE(B)PAN 2.6*8
507	82P166005N	POLYSLIDER WASHER(CUT) 1.6*6.0*T0.5
508	82Q3154B3N	POLYSLIDER WASHER 3.1*5.4*T0.13
509	810A130604	SCREW/WASHER(A) M3*6
510	810B126604	SCREW/WASHER(B) M2.6*6.0
511	8102130304	SCREW,PAN M3.0*3.0
512	8102126A04	SCREW,PAN M2.6*10
513	810A123504	SEMS A M2.3*5.0
514	850PAA0197	SCREW,MOTOR M3*5
515	82P266005N	POLYSLIDER WASHER(CUT) 2.6*6.0*T0.5
516	82Q264713N	POLYSLIDER WASHER 2.6*4.7*T0.13
517	82P26A005N	POLYSLIDER WASHER(CUT) 2.6*10*T0.5
CD1001	068722058A	CORD EIS CONNECTOR 8722058A
CD2001	122W060803	CORD JUMPER 2W060803
CD5001	122L051501	CORD JUMPER 2L051501
H5001	1523D91029	HEAD,AUDIO CONTROL HVMZA1254A
H5002	1543D02010	HEAD,FULL ERASE HVFHF0059A
M101	1596P48001	MOTOR,LOADING MXN-13FB09C
M2001	1510398028	CAPSTAN DD UNIT F2QTB27
M2003	1589V11004	MICRO MOTOR EP14BA
SW101	0520244003	MODE SWITCH SRZZ0B068B
⚠ UN4001	A4B305A500	CYLINDER UNIT ASS'Y A4B305A500

ELECTRICAL REPLACEMENT PARTS LIST

REF.NO.	PART NO.	DESCRIPTION	
RESISTORS			
⚠ R512	R3X28A563J	R.METAL OXIDE	56K OHM 2W
⚠ R520	R3X181820J	R.METAL OXIDE	82 OHM 1W
R522	R00202331J	RC	330 OHM 1/2W
⚠ R525	R3X181010J	R.METAL OXIDE	1.0 OHM 1W
⚠ R529	R61584221J	R.FUSE	220 OHM 1/4W
⚠ R537	R615U45R6J	R.FUSE	5.6 OHM 1/4W
⚠ R1087	R635812R7J	R.FUSE	2.7 OHM 1W
R4528	R00106750J	RC	75 OHM 1/6W
R5539	R00106473J	RC	47K OHM 1/6W
CAPACITORS			
⚠ C504	P2222B104K	CMP	0.1 UF 250V AC
⚠ C505	CB3LE0ML3M	CC	0.0033UF 250V
⚠ C506	CB3930ML3M	CC	0.0033UF 250V
C508	E02TFH680M	CE	68 UF 400V
C509	C0J0B0612K	CC	100 PF 1KV B
C512	P312F5103J	CPP	0.01 UF 630V
C525	E50HU54R7M	CE	4.7 UF 50V
C701	CHG0F0415Z	CC	0.1 UF 25V F
C708	E50HU2470M	CE	47 UF 16V
C4085	CHG0B0412J	CC	100 PF 50V B
C4086	CHG0B04Q2K	CC	470 PF 50V B
C4102	E02P00470M	CE	47 UF 6.3V
C4111	P6M300104J	CMPL	0.1 UF 50V TF
C4130	E02P00470M	CE	47 UF 6.3V
C4514	CHG0B04Q2K	CC	470 PF 50V B
C4524	CHG0B04Q2J	CC	470 PF 50V B
C4531	CHG0CH411J	CC	10 PF 50V CH
C5540	CHG0B04Q2J	CC	470 PF 50V B
C5541	E50HT54R7M	CE	4.7 UF 50V
C6301	E02L00102M	CE	1000 UF 6.3V
C6320	CHG0SL4Q1J	CC	47 PF 50V SL
C6651	P1S300332J	CP	0.0033UF 50V
SEMICONDUCTORS			
D501	D28T011E10	DIODE,SILICON	11E1TA1B2
⚠ D504	D410S1NB60	DIODE	S1NB60
D509	D1VT001330	DIODE,SILICON	1SS133T-77
D510	D23TDSK10E	DIODE,RECTIFIER	DSK10E-BT
D511	D2BT0EG01C	DIODE,RECTIFER	EG-01C
⚠ D512	D28T1DQ040	DIODE,RECTIFIER	21DQ04-TA2B1
⚠ D513	D13TGMA020	DIODE,SILICON	GMA-02-BT
⚠ D514	D28T1DQ090	DIODE,RECTIFIER	21DQ09-TA2B1
⚠ D515	D13TGMA020	DIODE,SILICON	GMA-02-BT
⚠ D516	D13TGMA020	DIODE,SILICON	GMA-02-BT
⚠ D517	D9JT01501B	DIODE,ZENER	UZ-15BCB-TA
D518	D1VT001330	DIODE,SILICON	1SS133T-77
D519	D28T1DQ040	DIODE,RECTIFIER	21DQ04-TA2B1
D521	D1VT001330	DIODE,SILICON	1SS133T-77
⚠ D522	D9J01300B2	DIODE,ZENER	UZP-30BK2
D1001	0001300030	LED	SLR-938C-4-AB
D1010	D28T011E10	DIODE,SILICON	11E1TA1B2
D1011	D28T011ES1	DIODE,SILICON	11ES1TA1
D1024	D28T011E10	DIODE,SILICON	11E1TA1B2
D1027	D97U06R21C	DIODE,ZENER	MTZJ6.2C T-77
D1028	D28T011E10	DIODE,SILICON	11E1TA1B2
D4001	D97U06R81C	DIODE,ZENER	MTZJ6.8C T-77
D4002	D1VT001330	DIODE,SILICON	1SS133T-77
D4501	D97U015010	DIODE,ZENER	MTZJ15 T-77
D4502	D97U015010	DIODE,ZENER	MTZJ15 T-77
D4510	D97U015010	DIODE,ZENER	MTZJ15 T-77
D4513	D97U015010	DIODE,ZENER	MTZJ15 T-77
D4515	D97U015010	DIODE,ZENER	MTZJ15 T-77
D4802	D1VT001330	DIODE,SILICON	1SS133T-77
D4803	D1VT001330	DIODE,SILICON	1SS133T-77
D5501	D1VT001330	DIODE,SILICON	1SS133T-77
D6609	D1VT001330	DIODE,SILICON	1SS133T-77
⚠ IC501	I0Q90431L0	IC	NJM431L
⚠ IC502	I0QA97810F	IC	NJM7810FA
IC651	I0XF516313	IC	UPD16313
IC703	I3ED656490	IC	SDA5649
IC1001	I56F57025A	IC	OEC7025A
IC1002	I53D08CB10	IC	ST24C08CB1
IC1003	IE1J031AA0	IC	RE5VL31AA-TZC
⚠ IC1004	I05S07291S	IC	TA7291S
IC4001	I05D31232N	IC	TA1232N
IC4002	I05D08850A	IC	TL8850AP
IC4101	I03F070020	IC	LA70020M
IC4501	I03D07156L	IC	LA7156L
IC4502	I03D071560	IC	LA7156

REF.NO.	PART NO.	DESCRIPTION	
SEMICONDUCTORS (CONT.)			
IC4801	I96D07023A	IC	OEC7023A
IC5001	I03D772860	IC	LA7286
IC5501	I07J701AK0	IC	BH7801AK-E2
IC6602	I0KDF98400	IC	TDA9840
IC6603	I05SB8721A	IC	TA8721ASN
⚠ Q501	TBWT009260	TRANSISTOR,SILICON	2SB926(S,T)-AA
⚠ Q503	TC3T042040	TRANSISTOR,SILICON	2SC4204-AA
Q504	TNYJA05001	COMPOUND TRANSISTOR	DTC143EKAT146
Q505	TNYJA05001	COMPOUND TRANSISTOR	DTC143EKAT146
⚠ Q506	TCB0049080	TRANSISTOR,SILICON	2SC4908
⚠ Q509	TBWT009260	TRANSISTOR,SILICON	2SB926(S,T)-AA
⚠ Q511	0002500480	PHOTO COUPLER	TLP621D4(GR)
Q1001	0002G00490	PHOTO COUPLER	GP1S94
Q1002	0000700320	TRANSISTOR,PHOTO	RPT-38PB113
Q1003	TCYT2872S0	TRANSISTOR,SILICON	2SC2872S
Q1004	0000700320	TRANSISTOR,PHOTO	RPT-38PB113
Q1005	TNYJC05001	COMPOUND TRANSISTOR	DTC124EKAT146
Q1006	0002G00490	PHOTO COUPLER	GP1S94
Q1007	TNYJC05001	COMPOUND TRANSISTOR	DTC124EKAT146
Q4001	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412AKT146
Q4004	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412AKT146
Q4005	T6YJ1037K0	TRANSISTOR,SILICON	2SA1037AKT146
Q4006	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412AKT146
Q4007	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412AKT146
Q4009	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412AKT146
Q4010	T6YJ1037K0	TRANSISTOR,SILICON	2SA1037AKT146
Q4011	T6YJ1037K0	TRANSISTOR,SILICON	2SA1037AKT146
Q4012	T6YJ1037K0	TRANSISTOR,SILICON	2SA1037AKT146
Q4013	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412AKT146
Q4015	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412AKT146
Q4016	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412AKT146
Q4018	TNYJD05001	COMPOUND TRANSISTOR	DTC144EKAT146
Q4019	TNYJD05001	COMPOUND TRANSISTOR	DTC144EKAT146
Q4101	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412AKT146
Q4102	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412AKT146
Q4503	TNQTD05001	COMPOUND TRANSISTOR	DTC144EKT147
Q4804	T6YJ1037K0	TRANSISTOR,SILICON	2SA1037AKT146
Q5001	TCKT013170	TRANSISTOR,SILICON	2SC1317-T
Q5502	TB10006440	TRANSISTOR,SILICON	2SB644
Q5503	TNYJC05001	COMPOUND TRANSISTOR	DTC124EKAT146
Q5504	TBWT006980	TRANSISTOR,SILICON	2SB698(E,F)-AA
Q5505	TCKT013170	TRANSISTOR,SILICON	2SC1317-T
Q5506	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412AKT146
Q6302	T6YJ1037K0	TRANSISTOR,SILICON	2SA1037AKT146
Q6303	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412AKT146
Q6602	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412AKT146
Q6603	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412AKT146
COILS & TRANSFORMERS			
⚠ L501	029X000070	COIL,LINE FILTER	SS10V-03330
L504	021W66220M	COIL,CHOKE	22 UH
L505	021W66220M	COIL,CHOKE	22 UH
L701	021673101K	COIL	100 UH
L4001	02167D101K	COIL	100 UH
L4002	021673101K	COIL	100 UH
L4004	021673101K	COIL	100 UH
L4005	021QA6471K	COIL	470 UH
L4006	021LA6560K	COIL	56 UH
L4008	021LA6560K	COIL	56 UH
L4009	021LA6560K	COIL	56 UH
L4012	021LA6390K	COIL	39 UH
L4013	021LA6330K	COIL	33 UH
L4101	021663101K	COIL	100 UH
L4102	021663101K	COIL	100 UH
L4504	021LA6220K	COIL	22 UH
L4506	021LA6220K	COIL	22 UH
L4507	021LA6220K	COIL	22 UH
L4508	021LA6220K	COIL	22 UH
L4509	021LA6220K	COIL	22 UH
L4510	021LA6220K	COIL	22 UH
L4513	021LA6100K	COIL	10 UH
L4514	021LA6100K	COIL	10 UH
L4515	021LA6100K	COIL	10 UH
L4516	02167D101K	COIL	100 UH
L4517	02167D101K	COIL	100 UH
L4801	021673101K	COIL	100 UH
L5001	021673102K	COIL	1000 UH
L5501	021673101K	COIL	100 UH
L5504	021673102K	COIL	1000 UH
L5505	031622001R	COIL	16220 UH

REF.NO.	PART NO.	DESCRIPTION	
		COILS & TRANSFORMERS (CONT.)	
L5506	021QA6391K	COIL	390 UH
L6301	021673101K	COIL	100 UH
L6302	02167D101K	COIL	100 UH
L6303	021J91680K	COIL	68 UH
L6304	02167D101K	COIL	100 UH
L6604	03361Z001R	COIL,SOUND IFT	361Z001
L6605	02167D101K	COIL	100 UH
L6606	021LA6100K	COIL	10 UH
L6607	021673101K	COIL	100 UH
⚠ T501	0481290064	TRANSFORMER,SWITCHING	8129006
T5001	031626001R	COIL,BIAS OSC	1626001
		JACKS	
J4501	063G100036	SOCKET,21PIN*2	035 0 8085 00
J5501	0602411004	JACK,PLATE	JPJ1148-010023
J5502	0602411004	JACK,PLATE	JPJ1148-010023
		SWITCHES	
SW601	0504201T31	SWITCH,TACT	SKHVBE075B
SW602	0504201T31	SWITCH,TACT	SKHVBE075B
SW603	0504201T31	SWITCH,TACT	SKHVBE075B
SW604	0504201T31	SWITCH,TACT	SKHVBE075B
SW605	0504201T31	SWITCH,TACT	SKHVBE075B
SW606	0504201T31	SWITCH,TACT	SKHVBE075B
SW607	0504201T31	SWITCH,TACT	SKHVBE075B
SW608	0504201T31	SWITCH,TACT	SKHVBE075B
SW1001	0550322004	SWITCH,LEAF	HXW0394-010010
		P.C. BOARD ASSEMBLIES	
PCB010	A4C015B01A	PCB ASS'Y	VM6120A
PCB230	A4C001B23A	PCB ASS'Y	VV6290A
PCB270	A4C015B27A	PCB ASS'Y	VE7803A
PCB330	A4C001B33A	PCB ASS'Y	VE7813A
		MISCELLANEOUS	
BT601	1412004008	BATTERY,MANGAN	R03(AB)E 20 T
⚠ CD501	1206655806	CORD,AC BUSH E2N 6FEET	06655806
CD601	06CH23042A	CORD,EIS CONNECTOR	CH23042A
CP501	0694430100	CORD,UX CONNECTOR	2-173270-3
CP651	069E230129	CONNECTOR PCB SIDE	8283_0312_00_000
CD4102	069E220129	CONNECTOR PCB SIDE	8283_0212_00_000
CD5501	122L041507	CORD,JUMPER	2L041507
CD6002	06CZL05015	RF CABLE PAL FTZ	D-2070
CF4502	1162LTQ2M1	FILTER,EMI	DSS306-93B471M10
CF4504	1162LTQ2M1	FILTER,EMI	DSS306-93B471M10
CF6601	1012T5R742	FILTER,CERAMIC	SFE5.74MC2-TF21
CF6602	1012T5R702	FILTER,C.DISCRI	CDSH5.74MC39KTF2
CP1001	06977K0580	CONNECTOR PCB SIDE	TMC-W20P-A1
CP1002	0697150310	CONNECTOR PCB SIDE	TAS-X05X-D1
CP4001	06977G0580	CONNECTOR PCB SIDE	TMC-W16P-A1
CP4101	069J7A0109	CONNECTOR PCB SIDE	IMSA-9603S-10C
CP4102	069R750499	CONNECTOR PCB SIDE	52492-0520
CP4103	06977K0570	CONNECTOR PCB SIDE	TMC-W20X-A1
CP4104	06977G0570	CONNECTOR PCB SIDE	TMC-W16X-A1
CP4105	069779M010	CONNECTOR PCB SIDE	TKC-F09X-L1
CP4106	069R760018	CONNECTOR PCB SIDE	52044-0645
CP4107	069R740018	CONNECTOR PCB SIDE	52044-0445
CP5501	069R740018	CONNECTOR PCB SIDE	52044-0445
CP5502	06CH22043A	CORD,EIS CONNECTOR	CH22043A
CUS011	800WF00004	CUSHION-A	
CUS012	800WF00019	CUSHION-C	
CUS231	800WF00004	CUSHION-A	
CUS232	800WF00019	CUSHION-C	
CX6301	069J1B0038	CONNECTOR PCB SIDE	IMSA-9130B-11
CX6302	069J1A0038	CONNECTOR PCB SIDE	IMSA-9130B-10
CX6303	069J170038	CONNECTOR PCB SIDE	IMSA-9130B-07
CX6304	069J190038	CONNECTOR PCB SIDE	IMSA-9130B-09
CY5501	069J1B0028	CONNECTOR PCB SIDE	IMSA-9131S-11L
CY5502	069J1A0028	CONNECTOR PCB SIDE	IMSA-9131S-10L
CY5503	069J170028	CONNECTOR PCB SIDE	IMSA-9131S-07L
CY5504	069J190028	CONNECTOR PCB SIDE	IMSA-9131S-09L
⚠ F501	080PT1R602	FUSE	21801.6
FH501	06710T0006	HOLDER,FUSE	TP00351-51
FH502	06710T0006	HOLDER,FUSE	TP00351-51
OS651	07T1000013	REMOTE RECEIVER	PNA4612M00YB
TM601	07660AN320	TRANSMITTER	SBER20134A
⚠ TU6001	0162601009	RF UNIT	TMLG2-104A
V651	096779R001	TUBE FLUCRESCENT DISPLAY	7-MT-201G
X1001	100CAD1203	CRYSTAL HC-49/U-S	12.0MHZ
X1002	100C32R803	CRYSTAL DSVT-200	32.768KHZ
X4001	100CA4R404	CRYSTAL HC-49/U-S	4.433619MHZ
X4801	100W17R702	CRYSTAL HC-49/U	17734.475KHZ
X6602	100CF01001	CRYSTAL HC-49/U-F	10MHZ

RESISTOR
RC.....CARBON RESISTOR

CAPACITORS
CC.....CERAMIC CAPACITOR
CE.....ALUMI ELECTROLYTIC CAPACITOR
CP.....POLYESTER CAPACITOR
CPP.....POLYPROPYLENE CAPACITOR
CPL.....PLASTIC CAPACITOR
CMP.....METAL POLYESTER CAPACITOR
CMPL.....METAL PLASTIC CAPACITOR
CMPP.....METAL POLYPROPYLENE CAPACITOR
CST.....STYROL CAPACITOR